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EDITOR'S

WELCOME

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If you've ever wanted to create amazing creatures for film, games and illustration then this is the issue for you! Cover artist Ian Joyner, who helped design the dinosaurs of Jurassic World, reveals his techniques for sculpting dynamic monsters on page 54. In our training section you'll discover how to craft textures for games in Substance Painter (page 66), create soft fur for animation in 3ds Max (page 74) and achieve photoreal textures for birds in Mari (page 60). You can bring it all together into a ZBrush 3D print too – and you can download the ZBrush model (right). If you want to take your training even further, turn to our feature on the 'new wave' of CG art training courses being offered worldwide by pro artists!

Ian Dean, editor
ian.dean@futurenet.com



**MODEL A 3D PRINT-READY
CREATURE IN ZBRUSH**
Sculpt the anatomy of an
imagined creature on page 78

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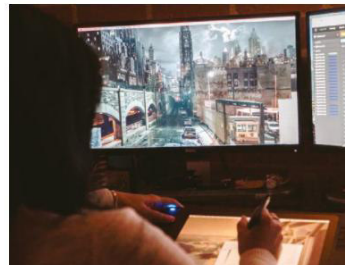
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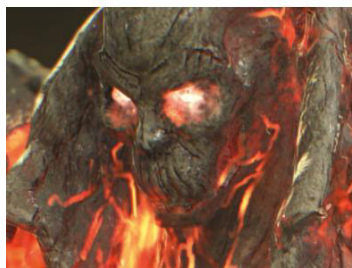
The new wave of CG training academies



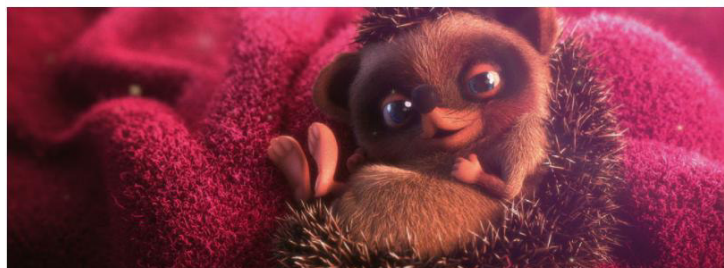
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ARTISTS

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Follow the free video training, download details on page 98.

ON THE COVER

This issue we're pleased to share Ian Joyner's process for designing and modelling a creature for feature film production.

Ian has worked in film CG and VFX for over 15 years, including creature design on Jurassic World, and most recently he's contributed to the forthcoming Suicide Squad.

You can read Ian's ZBrush modelling tutorial on page 54.

SPOTLIGHT ON OUR CONTRIBUTORS



Francesca Forzoni

A 3D artist/visualiser in London, Frankie recently moved from post-production to branding and packaging and currently works at Design Bridge. She joins our Artist Q&A panel on page 30 to explain how to create a liquid-metal effect in Cinema 4D.

www.francescaforzoni.com



Paul H. Paulino

Paul is a texture painter and look development artist currently working in Vancouver, Canada, at Scanline VFX. You can read his tutorial on page 60, where the artist reveals how he uses references to model and texture a lifelike bird in Maya, Mari and V-Ray.

www.paulhpaulino.com



Mark Osborne

Mark is an American filmmaker and animator who brought the world Kung Fu Panda. This issue we catch up with the director to discuss the cinematic adaptation of The Little Prince, and how he mixed rendered CG animation with traditional stop-motion.

www.bit.ly/208-mark-osborne



Josh Carey

Josh is the head of rigging at Reel FX Studios and co-founder of the online rigging school, RiggingDojo.com. This issue Josh reveals how he creates and uses the ribbon rig techniques to create unique animal animations – read the training on page 70.

www.cgjosh.com



Per Haagensen

Per is a concept artist and illustrator working at EA studio DICE. This issue, on page 40, we sit down with Per to discuss his career, why he moved from traditional artist to CG and how he feels his background helps him create amazing art.

www.bit.ly/per-haagensen



Ludovic Lieme

Ludovic is a CG generalist artist based in Paris who has worked in the advertising, animation series and feature animation movies sectors. On page 74 Ludovic reveals how to make a fluffy, furry creature from scratch using 3ds Max and Ormatix.

www.artstation.com/artist/ludoviclieme



CONTACT US

3D WORLD MAGAZINE FUTURE PUBLISHING

Quay House, The Ambury,
Bath, BA1 1UA

telephone: +44 (0) 1225 442244
email: enquiries@3dworldmag.com
website: 3dworld.creativebloq.com
facebook: www.facebook.com/3dworldmagazine
twitter: @3DWorldMag

EDITORIAL

EDITOR *Ian Dean*

ART EDITOR *Darren Phillips*

PRODUCTION EDITOR *Felicity Barr*

COMMISSIONING EDITOR *Julia Sagar*

STAFF WRITERS *Alice Pattillo, Dominic Carter*

CONTRIBUTORS

Cirstyn Bech-Yagher, Josh Carey, Pietro Chiovaro, Tanya Combrinck, Alex Duce, Francesca Forzoni, Sébastien Giroux, Mike Griggs, Paul Hatton, Trevor Hogg, Steve Jarratt, Ian Joyner, Ludovic Lieme, Kulsoom Middleton, James Morris, Josh Parks, Paul H. Paulino, Zeno Pelgrims, Cecilia Piemontese, Rob Redman, Aybars Turan, Alvin Weetman

MANAGEMENT

MANAGING DIRECTOR MAGAZINES DIVISION *Joe McEvoy*

EDITORIAL DIRECTOR *Matthew Pierce*

GROUP ART DIRECTOR *Rodney Dive*

ADVERTISING

ADVERTISING MANAGER *Sasha McGregor*

(0)1225 687675 sasha.mcgregor@futurenet.com

ACCOUNT DIRECTOR *George Lucas*

(0)1225 687311 george.lucas@futurenet.com

SALES EXECUTIVE *Chris Mitchell*

(0)1225 687832 chris.mitchell@futurenet.com

PRODUCTION & DISTRIBUTION

PRODUCTION CONTROLLER *Nola Cokely*

PRODUCTION MANAGER *Mark Constance*

PRINTED IN THE UK BY: William Gibbons & Sons Ltd
on behalf of Future.

DISTRIBUTED BY: Seymour Distribution Ltd, 2 East Poultry
Avenue, London EC1A 9PT, Tel: 0207 429 4000

OVERSEAS DISTRIBUTION BY:

Seymour International

CIRCULATION

TRADE MARKETING MANAGER *Juliette Winyard*

07551 150 984 juliette.winyard@futurenet.com

LICENSING

SENIOR LICENSING & SYNDICATION MANAGER

Matt Ellis Matt.Ellis@futurenet.com

+ 44 (0)1225 442244 Fax +44 (0)1225 732275

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ARTIST

SHOWCASE

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the CG community



ROBOTIC MOUSE



ARTIST

Amanda Mierau

SOFTWARE Maya, ZBrush,
KeyShot, Photoshop

Canadian-based 3D modeller and generalist Amanda Mierau created her sleek Robotic Mouse over three weeks. Having previously worked for Method Studios and as a marketing 3D freelancer, Amanda found this personal project a pleasant change of pace. "I enjoyed designing this little guy, and seeing him come to life," she says. "Figuring out how certain parts would function and adding character and personality to him was quite rewarding."

With a degree in fine arts under her belt, plus an extra year of 3D schooling, Amanda rendered her rodent without encountering any problems. "The packages these days have great features designed to facilitate workflow," she explains. "The intricacy comes more from patience and attention to every vertex, rather than complex techniques."

Robot Mouse accompanies other images in Amanda's portfolio of animals and detailed objects, but it represents the first time the two merge together in one piece. "I find the edges and curves of the world around me to be inspiring," she explains. "While the personalities and souls of animals can be as tangible as those of people, I am also very much inspired by intricacy – tiny and beautiful and mechanical. Those two things came together in my vision of creating this piece."

FYI

See more of Amanda's impressive creatures at www.amandamierau.com



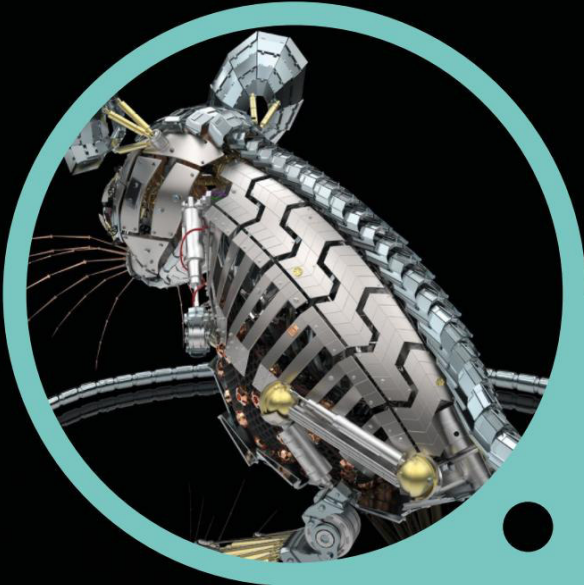
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COMING TO LIFE
Adding character to her mouse was one of Amanda's favourite parts of the project



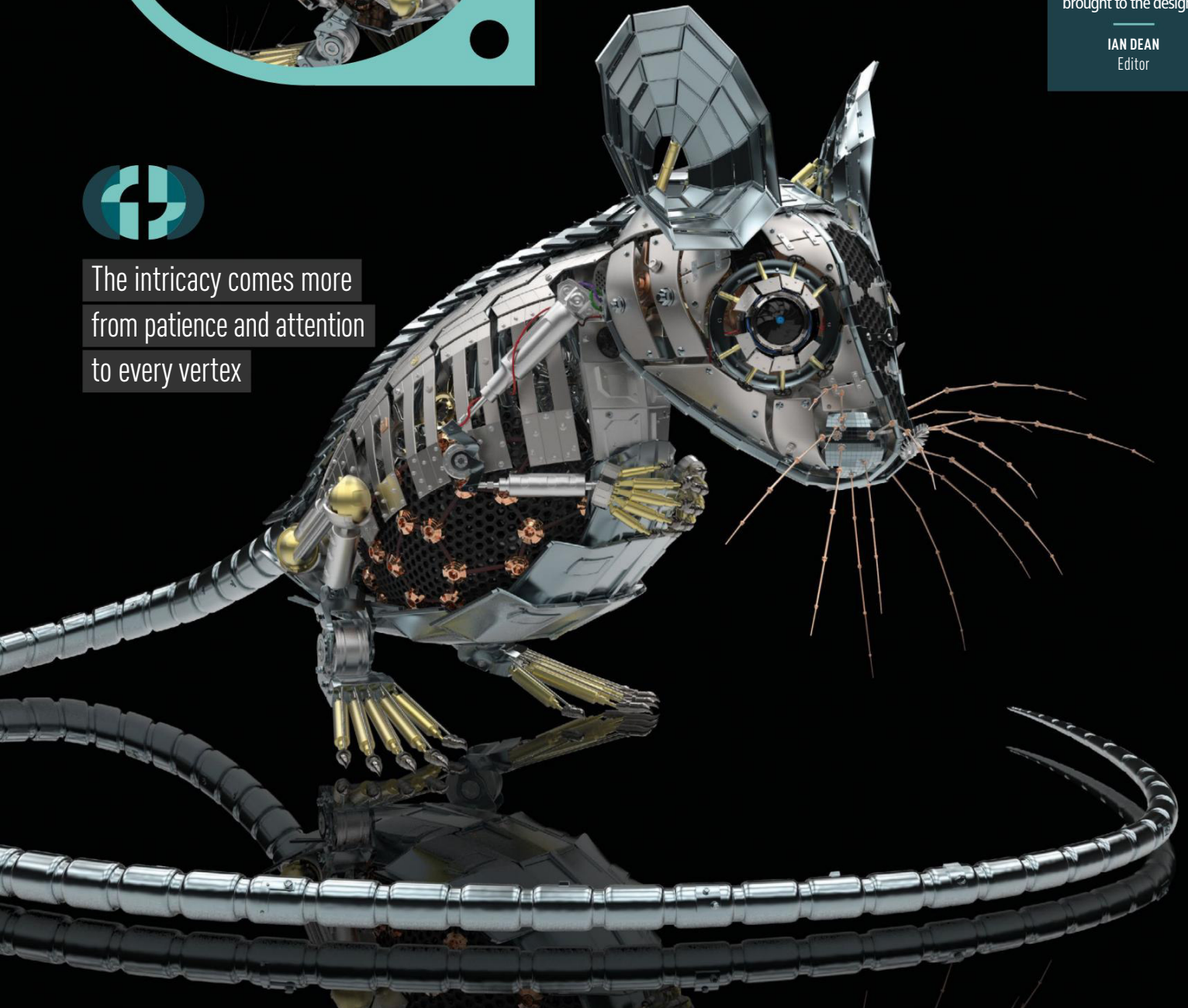
3D WORLD VIEW

"Amanda's attention to detail has enabled her to create a creature with real personality. I love the mechanical influence brought to the design."

IAN DEAN
Editor



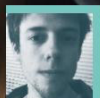
The intricacy comes more from patience and attention to every vertex





I like to model every
element in great detail

CONCH



ARTIST

Mateus Kurzhals

SOFTWARE 3ds Max, mental ray,
ZBrush, Photoshop, Mari

Brazilian creative Mateus Kurzhals is a self-taught 3D artist who learnt about the medium through books and the internet. Now based in Vancouver, Mateus is currently studying animation and visual effects, and hopes to break into the entertainment industry.

Outside of his freelance work, which mainly focuses on advertising, marketing and packaging, Mateus works on personal projects such as Conch. Completed over roughly two-and-a-half months during his spare time, Conch takes its inspiration from William Golding's novel *Lord of the Flies*.

"I'm inspired by music, art and books in particular," Mateus explains. "Because they force the mind to use a visual library in order to imagine the story, the environments and the characters."

Conch is the first time that Mateus used Mari to texture a scene. It also saw him creating the character's hair using the curves from ZBrush's FiberMesh. "Since this was a personal project, I had no boundaries for exploring," he says. "I like to model every element in great detail, even though some of them will be blurred in the background later, for example the rifle in the background of this image." To finish off the piece, Conch was composited in Photoshop.



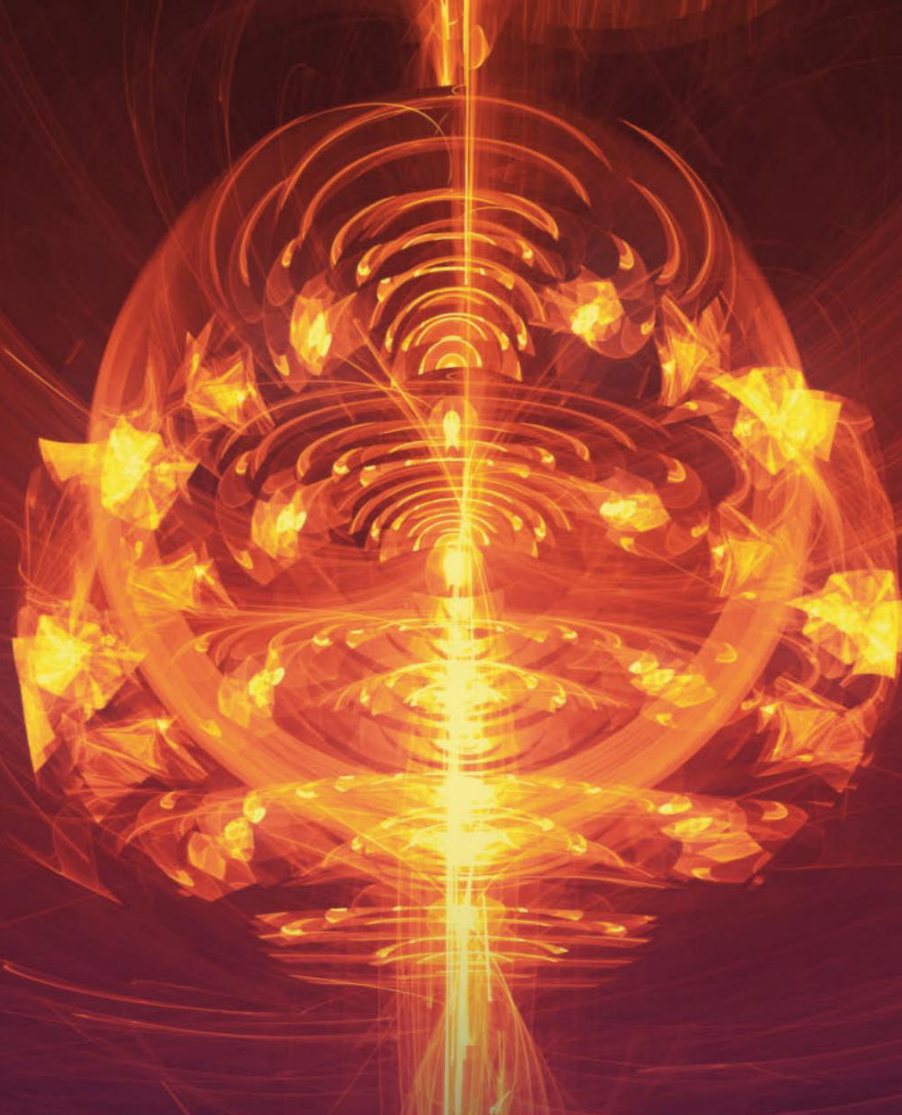
To explore more of Mateus' portfolio, go to
www.behance.net/mkurzhals



3D WORLD VIEW

"I'm pleased Mateus had the confidence to explore new software – it's really paid off. Mari is a great texturing tool."

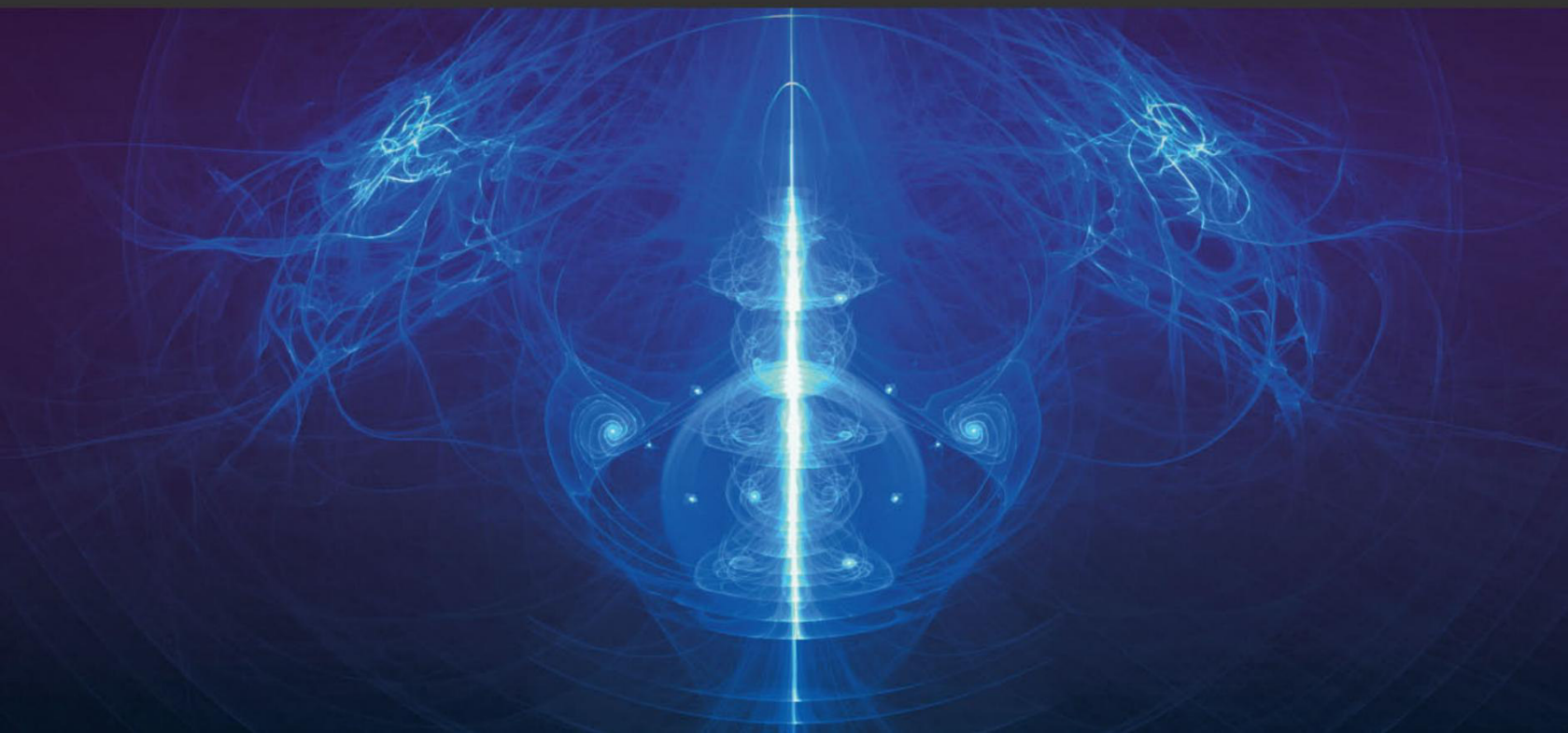
FELICITY BARR
Production editor



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CEMETERY OF CARS



ARTIST
Gilvan Isbiro
SOFTWARE 3ds Max, V-Ray,
Photoshop

Architectural visualiser Gilvan Isbiro has been learning about 3D art for 10 years, and in that time he's made some inspirational contacts. "The idea to create this image came when a friend of mine, Yasser Elkhodeiry, was working on another personal project," the Brazilian-based artist explains. "He was looking for references of dirty streets and came across an image of abandoned and destroyed cars. I liked this idea and decided to make something similar."

The lifelike 3D artwork of Mark Denko also influenced the recently completed Cemetery of Cars. "I especially like the amount of detail he packs into his scenes," explains Gilvan. "I also admire the way he works materials and how realistic his scenes look." Reaching a similar standard of detail was Gilvan's proudest achievement while working on this piece. "I'm also pleased with how I worked the material of the cars as I mixed them," he says.

Gilvan used a lot of blend materials and two vertex paint modifiers to make the shade of the cars, while MultiScatter plug-ins created the ground and some of the leaves on the cars. "To make the materials of the cars themselves, I used Blend and the Vertex PaintModifier," he concludes.

FYI For more insight into Gilvan's work, visit www.ng3d.blogspot.co.uk



3D WORLD VIEW

"It's great to see artists taking inspiration from one another. I especially like Gilvan's detailing here – very impressive."

DARREN PHILLIPS
Art editor



I'm also pleased with how
I worked the material
of the cars

IMAGE COURTESY OF HOSSEIN DIBA



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THIS MEANS WAR



ARTIST

Jean-Michel Bihorel
SOFTWARE Maya, Mari,
V-Ray, Nuke

Created during his spare time over three months, Paris-based artist Jean-Michel Bihorel's *This Means War* comes with its own backstory. "Once again the naughty little sister caught 'Pahl the robot' and gave him a hard time – but enough is enough!" he explains. Although currently freelancing as a 3D generalist for commercial projects, Jean-Michel hints that this piece will be part of an upcoming project tantalisingly titled *Creative Seeds*.

When it comes to his own creative inspiration, Jean-Michel reveals that "the work of the community is a great motivation to keep me improving my work." He adds that "initially, I guess, it was the fascination of creating environments and characters out of nothing that made me so fond of CG."

With a portfolio of stylised yet realistic works, it comes as no surprise that *This Means War* blends the realistic and the fantastical. This even applies to the making of the image. "The background is a photo but I photo scanned the environment in order to have a rough geometry of the set, to cast proper shadows and reflections onto the character," he explains. "I particularly enjoyed mixing the photo, the 3D scan and the 3D render together to output the final picture."

FYI

Explore more of Jean-Michel's stylised work at www.jmbihorel.wordpress.com



FEELING INSPIRED

Jean-Michel was initially drawn to CG as he wanted to create characters and environments out of nothing



The background is a photo
but I photo scanned
the environment



3D WORLD VIEW

"We like 3D work with a backstory and Jean-Michels blend of reality and fantasy makes for a terrific character. This is great fun!"

IAN DEAN
Editor



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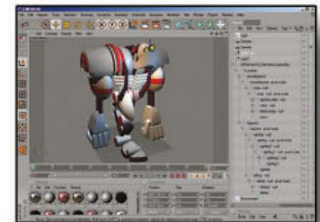
Autodesk's 3ds Max 2016



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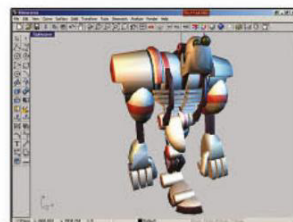
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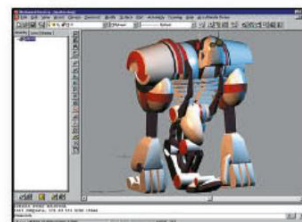
NewTek's Lightwave 2016
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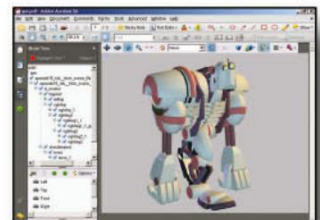
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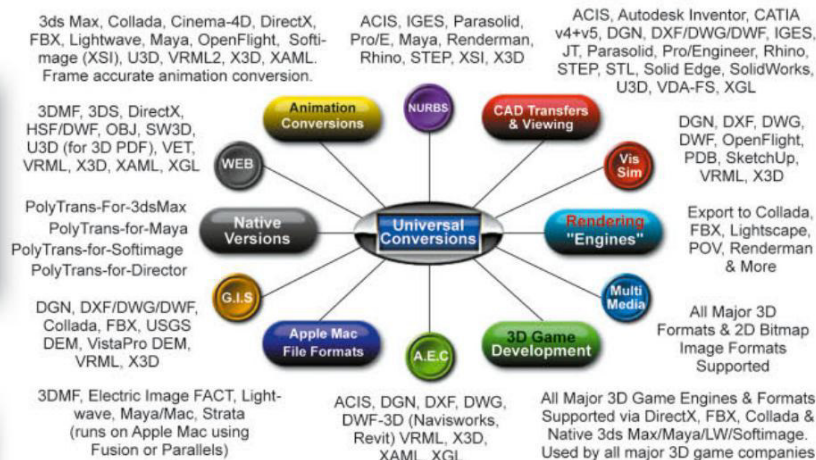


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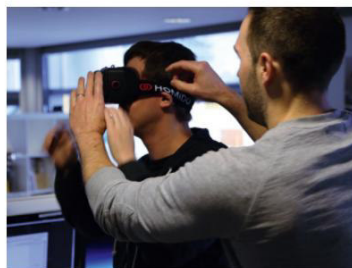
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 THE BIG ISSUE

ARE WE IN VIRTUAL REVOLUTION?

VR is back and it means business! **Jim McCauley** reveals the new software tools that will change how you work

2016 is set to be a battleground for software with so many VR solutions entering the market

You couldn't have missed the launch of Oculus Rift, following on the heels of Samsung's Gear VR, and with the HTC Vive and Playstation VR to follow by October, 2016 is set to be a big year for virtual reality – and the big names in 3D are scrambling to support it.

With GDC and NAB proving perfect platforms to get the message out, the big software players were keen to elbow their way into the VR sector. Maxon's big reveal is CV-VR Cam, a new VR plug-in for Cinema 4D released through its education and resource website, Cineversity. CV-VR Cam is designed to enable artists to create pre-rendered or interactive VR content, and can render spherical or cubic VR in both monoscopic and stereoscopic format.



"From my perspective VR production is still a huge mess and there is much research necessary for new entrants to the VR world," comments CEO at mOculus.io Dominik Capodici who says as a Maya user he's already

prepper for VR. "I have access to tools like our vr-plugin.com and the andrewhazelden.com toolbox."

It's no surprise then that Autodesk is grasping VR with new releases of Maya LT and its Stingray game engine, providing a set of VR tools aimed at professional indie game makers. Stingray 1.2 now has native

We may use VR to create non-VR content... that's an interesting prospect

Ben Kidd, co-founder, Curiscope

support for HTC Vive as well as Oculus Rift, and now features multi-threaded project compilation as well as several new features, including an interactive GPU-based lightmap baker, improved screen space ambient occlusion and a new debug view that makes it easier to see the in-focus and out-of-focus areas.



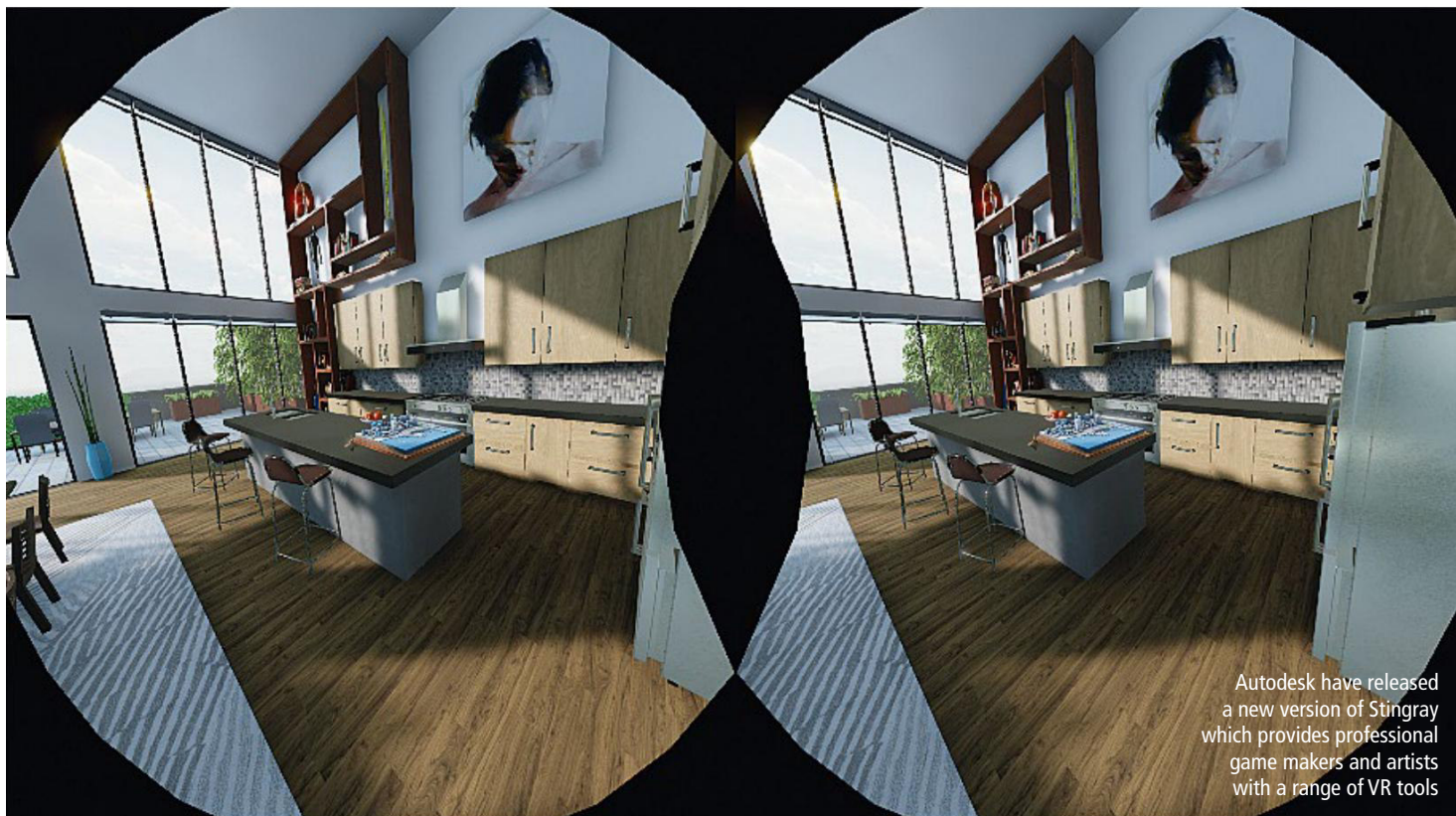
"Since the Autodesk Stingray engine can be connected directly to our 3D tools like Maya and 3ds Max, it makes the artistic or technical changes turnaround time quite fast. This lets developers and designers tweak their content more easily and often, so they can find the sweet spot for their VR games," says Autodesk's Frank DeLise, Sr.

The advance in software options is good news for VR developer Ben Kidd, whose Great White Shark project has garnered a lot of attention.

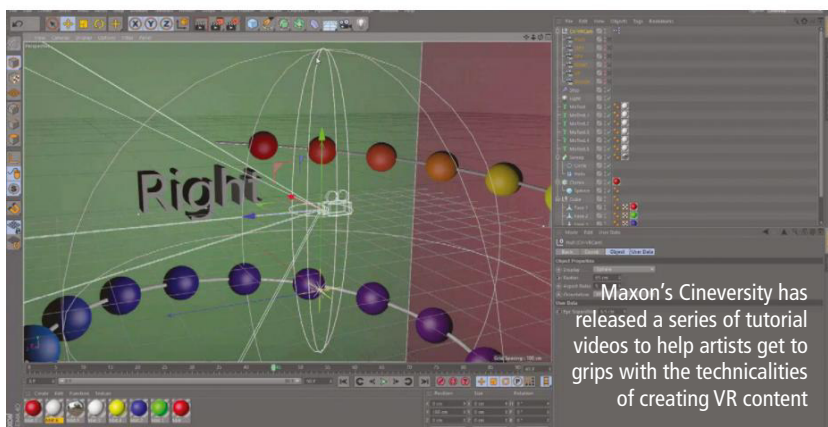


"Being able to be in VR while you work will be the best way forward; it means you can make instant decisions," says the artist. "VR will offer a direct way of working. You will go in and layout a scene, architects will jump in... game engines will be used to design cars."

There's some free solutions too, with CryEngine V offering a 'pay what you want' pricing scheme that allows you full access to the entire engine feature-



Autodesk have released a new version of Stingray which provides professional game makers and artists with a range of VR tools



Maxon's Cineversity has released a series of tutorial videos to help artists get to grips with the technicalities of creating VR content

set and source code for a fee of your choice. CryEngine V also expands its VR hardware support and now covers Oculus Rift, HTC Vive and Playstation VR, as well as the open-source OSVR. Amazon are on their heels too, with its own free-to-use Lumberyard platform.

The Foundry has already embraced VR workflows, says CTO Jon Waderton,



"Our customers are already using the image processing expertise in Nuke as well creating CGI content for 360 video using Modo and Mari. Modo, for example, provides a simple workflow for rendering 360 stereo imagery by simply changing the Modo camera projection to VR Pano."

It's a commitment being furthered for Modo 10, due for release in the autumn, which promises to provide a toolset capable of creating real-time assets for games and VR, featuring a streamlined and repeatable texture baking workflow.

Perhaps the best news for VR developers, though, came from Unity Technologies, with its announcement that it's adding full support for Nvidia's

VRWorks SDK to the Unity engine. This means that artists working with Unity will be able to create VR games that take full advantage of Nvidia VR tech, including multi-res shading and VR SLI, which enables developers to intelligently split VR rendering across multiple GPUs.

It's clear a stage is being set for 2016, as Ben says, "Is VR the new battleground for software? Absolutely, that's where we are right now." The consensus is we need the tools. "Image trying to create a TV show before the TV was invented, it's like that, we're still finding out how to do this as we go."

When you also consider Unity's VR Scene Editor – which enables you to build scenes within a VR environment – called The Chessboard, a more advanced editing mode that provides new tools and more precise object manipulation options, the future is going to be fun. "We may use VR to create non-VR content... that's an interesting prospect," Ben concludes.

FYI Take a look at the [moculus.io](http://www.moculus.io) plug-in for Maya at www.moculus.io



INDUSTRY INSIDERS

Thoughts & opinions from the experts



FRANK DELISE, SR.
Director, games solutions, Autodesk Media & Entertainment
www.autodesk.com

"I see that developers want to establish themselves in these early days of VR by creating really compelling experiences as quickly as they can. Another major challenge for developers is finding the balance between visual quality and hitting the required refresh rates that make for a good VR experience. An important part of finding that balance is being able to iterate your 3D content as fast as possible."



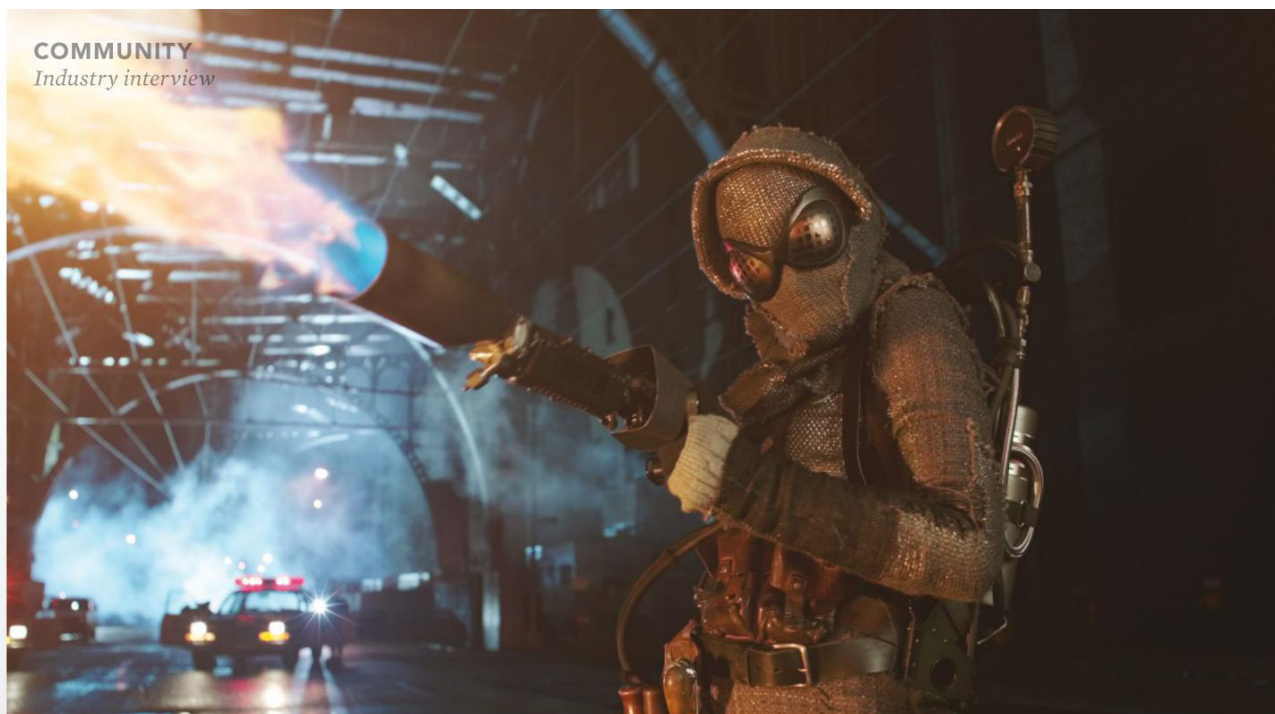
DOMINIK CAPODIECI
CEO, mOculus.io
www.bit.ly/dominik_capodiec

"I am very well connected to lots of developers and I can assure you there will be a big twist in 3D production very soon. You have to see it yourself to get the advantages of doing 3D tasks directly in a 3D environment instead of just a 2D monitor. The tools that are in development right now will help future artists to create VR worlds more intuitively and natural than ever before."



FRANK VITZ
Creative director, CRYENGINE
www.crytek.com

"At Crytek we're enthusiastic adopters and developers of new technologies, particularly ones offering more realistic or immersive experiences. CryEngine V helps solve many of the technical challenges of VR for developers. Alongside the development of these tools we are also contributing to a new VR storytelling language that can leverage the full power of the medium."



THE ART OF
INVISIBLE VFX

Zero VFX faked
1970s Boston

SUBTLE CGI

It may not have the fantasy of Gotham but Black Mass posed similar challenges for Zero VFX. The 375 shots worked on by Zero included recreating 1970s Boston. "It was challenging, but I think 99.9% of the people who see it will never know we touched a single frame of it," says VFX supervisor Sean Devereaux.

CG SNOW

Using tools, including Maya, Nuke and Photoshop, Zero VFX transformed mild spring to a stark winter. This involved creating CG snow: "Any time you see snow in the film, it was added by us," says Sean.



MOVING BUILDINGS

Entire buildings were removed from some shots, concludes Sean: "We did a lot of work, but what I'm really proud of is that, of all the work we've done at Zero, Black Mass truly is one where you'll never know we were there."

INDUSTRY INTERVIEW

THE CRAZY WORLD OF GOTHAM

CoSA VFX's *Joseph Bell* sheds some light on creating the gritty realism of Gotham City...

JOSEPH BELL

Joseph is executive producer at CoSA VFX. The team have been Emmy-nominated three years in a row, including a nomination for Gotham in 2015. www.cosavfx.com



A show like Gotham: Rise of the Villains lives and dies on selling its characters, so CoSA VFX had its work cut out when it was asked to build the biggest personality: the city of Gotham. "CoSA's shots run the gamut from subtly 'Gothamising' real-life New York City locations to creating 100 per cent computer generated buildings and environments," explains executive producer Joseph Bell. "The exterior of Arkham Asylum, for example, was filmed outside a real hospital in Staten Island, and then extensively modified by adding CG roofs, sculptures, and weathering. As the series progressed, CoSA built CG assets for more and more of the location, until we had the ability to create entirely computer-generated shots of Arkham featuring dynamic camera moves, without any practical photography."

While perhaps not containing the same volume of VFX shots as Warner's The Flash, Gotham still packed an impressive 1,500 VFX shots across the first season's 22 episodes – and Season 2 has continued this intensive run. Sometimes this has meant building upon real-life shots, but other times, it's meant generating entire CG locations from scratch to add depth and an authentic atmosphere to the show's dark tone.

"The show has a gritty, naturalistic feel that requires seamless and convincing visual effects," says Joseph. "We've tried to set and sustain a very high bar in terms of the quality of the imagery, sequence after sequence, week after week. If we've done it well, the audience won't notice some of our best work, because it looks so real."

Working on an episodic TV show poses unique challenges. The scripts for future

We had the ability to create
entirely computer generated
shots of Arkham...

episodes are usually written just a few weeks before the finished ones are due to air on TV. Flexibility matters, so the team at CoSA turned to ftrack.

"An episodic TV show like Gotham is like a marathon made up of sprints," says Joseph. "Workload fluctuates constantly from one episode to the next, and the visual effects team is prepping one episode even as they're starting work on another and finishing a third. It's great that ftrack enables us to assign crew to Gotham – and all our shows – in a very flexible way. It's also great for tracking the smallest details on the largest projects, which is exactly what a season of Gotham needs."

FYI Explore CoSA VFX's work by visiting www.cosavfx.com

A real hospital was used for the exterior of Arkham Asylum. The images below show the location after it was extensively modified by VFX





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STUDIO PROFILE

LOOKING BEYOND THE TOOLS OF THE TRADE

Creative and animation studio, Mi, tells *Sammy Maine* how playing it safe has kept them ahead of the game...



Being a small indie studio enables Mi to concentrate on being creative

Playing it safe is not really a phrase you immediately associate with the creative industry, but for Manchester-based studio, Mi, playing it safe is something that has enabled it to flourish.

Working across games, architecture, brands and TV, managing director Anthony Hartley Denton prides Mi on professionalism, structure and flawless systems.

"Mi works on the basis of system over goals and consistency over intensity," he begins. "It's suited us better to have a daily philosophical framework from which to operate daily, rather than a distant abstract goal. The speed of evolution of most industries now precludes anyone from making anything more than a 'best guess' as to where they will find themselves in 24-36 months."

Choosing to look no further than six months at a time, Mi's professionalism is its stand-out trademark that has enabled the studio to work with the likes of Sony and the BBC.

Creating everything from in-game movies to fully interactive online dramas, Anthony asserts that this diversity in their work is the reason the

team is still so passionate about what they do, and he encourages artists at Mi to see beyond the technology, and instead focus on the story and being creative. "The briefs are so varied it encourages you to fall out of love quickly with the technologies and simply see them as what they are – tools," he explains. "Too much commercial work is a victim of the technology which created it; just because they could do something no one stopped to think if they actually should."

The studio uses industry-standard tools, such as Maya, 3ds Max, Unity and ZBrush as their main 3D tools. All rendering is done in V-Ray, with compositing in Photoshop or Nuke and motion graphics in After Effects.

"We also have our own render farm managed with Deadline," says technical director Gareth Thatcher. "Plugging into that is the thing that makes us more efficient."

The team who come from varied backgrounds in animation, architecture, games and VFX, are like-minded, enjoying a "relaxed work environment, training, competitive pay and pension," says Gareth. Mi

ANTHONY HARTLEY DENTON

Anthony is the managing director at Mi, an award-winning, creative production studio he co-founded 10 years ago. The studio's clients range from the BBC to Adidas and Sony.

www.wearemi.com



GARETH THATCHER

Technical director Gareth has worked at Mi for the past six years. He was part of the team behind Our World War, for which Mi created its own bespoke technology.

www.wearemi.com



STUDIO STATISTICS

LOCATION
Manchester, UK

TEAM SIZE
22

KNOWN FOR
CGI, 2D and 3D animation, branded entertainment content, games, smartphone apps, merchandising

MANAGING DIRECTOR
Anthony Hartley Denton



Everybody is constantly evolving and raising the bar – you can't rest on your laurels or you will quickly be left behind



OFFICE BRIEFING

Founded in 2005, Mi is an award-winning independent producer of audiovisual content and associated products based in Greater Manchester. The studio specialises in games, architecture, brands and broadcast, focusing on inspiring CGI, animation and interactive development. The staff, led by managing director Anthony Hartley Denton and senior 3D artist Chris Cragg, have varied backgrounds which enables them to offer focused, strategic creativity and technical know-how. The studio has a wide range of clients including Sony, the BBC, Playstation and Adidas.



prides itself in looking after its staff, offering an early finish on Fridays, nights out and paid over time, and there's also beer o'clock!

Working at Mi doesn't come without its challenges though; working on the Our World War: Interactive Episode was one of the studio's most difficult projects to date. What would have been a comfortable six-month project had to be delivered in just three months: "I was spread across most areas of pre- and post-production – some of which were new to me," Gareth recalls. "Not knowing how many people were going to hit the site was a worry. We had more hits than expected though, over 600,000 across desktop and iOS/Android devices, but all ran smoothly and no clean-up was required."

CHRIS CRAGG

Chris has worked as a senior 3D artist at Mi for the past two-and-a-half years. His credits include Our World War: Interactive Episode, for the BBC. www.wearemi.com

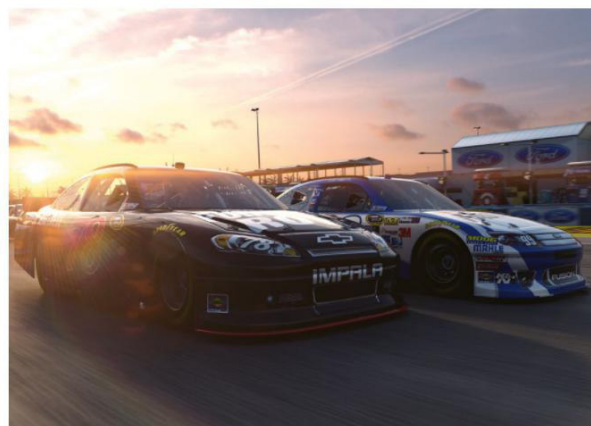


Senior 3D artist Chris Cragg adds that keeping pace with the industry and Mi's peers is also a challenging aspect of their work. "Everybody is constantly evolving and raising the bar – you can't rest on your laurels or you will quickly be left behind," he explains. Working at Mi has given Chris the opportunity to create some standout art, with personal highlights including making the front cover for Sony's LittleBigPlanet Vita Marvel edition. "The job was great to work on from a creative and practical stance and seeing the cover on shop shelves was the high point," he says. "The work is fast paced and challenging, but enjoyable. The staff and the relationships between us make the studio lively and fun."

"It's a challenging but ultimately very rewarding time to be in business," agrees Anthony. "We just want to keep doing exciting work for great clients."

FYI To find out more about Mi and see examples of the studio's work, visit www.wearemi.com

STUDIO PORTFOLIO



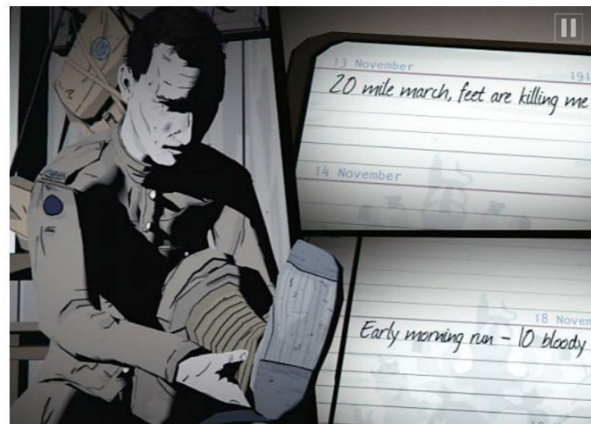
NASCAR: INSIDE LINE – GAME TRAILER

This one-minute in-game movie for Eutechnyx and Activision depicts race car driver Carl Edwards giving a blow-by-blow account of what it takes to win the race, with CGI supporting and inspirations taken from several different races and outcomes last year.



TROLL AND I – GAME TRAILER

Mi was asked by long-term clients Spiral house to produce some high-res characters and environments for an epic three-minute game trailer/X-movie. The team describe this project as their "greatest and most enjoyable CGI animation journey yet!"



OUR WORLD WAR: INTERACTIVE EPISODE

Mi created a fully interactive online drama episode to accompany the BBC3 series. The interactive episode, a first in its sector, sees the player guide the fortunes of a small group of soldiers led by a young corporal as he fights to keep the men alive in the fight for High Wood at The Battle of the Somme.



INDUSTRY NEWS

CREATE A KILLER PORTFOLIO

Rookies judge **Justin Mohlman** shares his tips for creating the perfect portfolio

With the deadline for entering new international awards scheme The Rookies (29 May) fast approaching, we caught up with game artist and educator Justin Mohlman to find out what else you can do to raise your profile as a creative. Justin is a judge at The Rookies – dubbed the ‘Oscars for creative students’ – and believes when it comes to self-promotion, creatives have it easier than when he was at school.

JUSTIN MOHLMAN

Justin is a game artist and educator with over 10 years' experience in the gaming world.
justinmohlman.com



“Tools like YouTube, Vimeo and Google, along with forums like Polycount, allow for easy sharing of content and learning,” Justin says. “But the best way, in my opinion, is to have a well designed, easy-to-navigate portfolio that loads quickly and is straight to the point. It should identify your primary and secondary skill set and showcase them with a few samples of quality work.”

focused, take time out to clearly identify your primary skill set and secondary skills – or those requested by a prospective employer, if you’re applying for a job – and showcase your best work in those areas.

Justin advises showing three to four quality pieces, pointing out that if you’re looking for a position at a studio, you need to fully research that studio and the requirements for the position. “Make sure your portfolio is tailored to the specific studio, that you meet all of the requirements, and that your portfolio and demo reel showcase them in a pleasing manner,” he explains.

“Often students will make a generic portfolio and cast a large net out and apply to every studio. All I can say is that studios can tell when that happens, and if they have the option between a generic application and someone who took the time to focus their portfolio on their studio and a specific position, they will take the more focused applicant. Of course, that’s also assuming the quality is on point to that studio’s standards.”

According to Justin, it also pays to research your competition: “Go on forums, and Google portfolios and

reels to see what other people are submitting and getting jobs with. It’s called job hunting for a reason – you need to prepare for it and hunt for that job.”

Flex your creative muscles

Another good tip is to make sure you’ve linked any social media channels – Facebook, Twitter, LinkedIn, Instagram – and other portfolio platforms to your website. “Vimeo is a good place to start,” advises Anna.

This can help greatly, adds Justin, in increasing the reach of your portfolio. “It’s all about presenting yourself in a professional manner, while staying active on forums and events, and showing progression in skill sets,” he says. “I’ve seen people on forums get work just simply from showing progression and growth in the work they do, and the industry pros who visit those sites taking notice.”

As a judge for The Rookies, Justin wants to see submissions from students who have taken the time to flex their creative and technical muscles on focused projects. He’s looking for entries to be displayed in a cohesive way, demonstrating

Often students will make a generic portfolio
and cast a large net out and apply to every
studio... studios can tell when that happens

Justin Mohlman, judge, The Rookies

So when it comes to creating a killer portfolio or showreel, Justin recommends keeping the narrative short and sweet. “The people reviewing your reels and portfolios are busy working professionals, with tasks outside of searching for applicants. This means that at times they need to be drawn in quickly to your work, and when they see poorly designed websites that fail to load or reels with long intros, they can be turned off from them.”

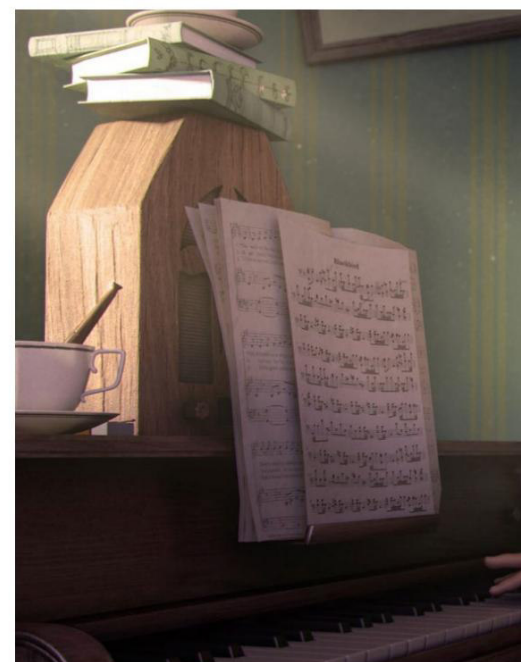
ANNA SWIFT

Anna has worked in recruitment within the creative industries for over a decade. She currently works at Framestore as a crewing and talent development manager.
www.framestore.com



Framestore’s crewing and talent development manager Anna Swift, agrees. She suggests that reels from job applicants should last for around a minute and include breakdowns. “We like to see that you can create the work, and that you understand the process behind it,” she explains. “Your best shot should be the first thing we see and we prefer quality over quantity.” To keep your portfolio and showreel

Rookies judge Justin Mohlman wants students to submit work showing technical ambition





When it comes to creating an impressive portfolio, the industry pros prefer quality over quantity

basic design principles alongside outstanding attention to detail.

The awards scheme is free to enter, and there are 12 categories to choose from: Architecture & Visualisation, Fashion Design, Game Design & Development, Graphic Design, Illustration & Concept Art, Industrial Design, Interior Design, Photography, Virtual Reality, Visual Effects & Animation, and Web & Application Design.

ALWYN HUNT

Alwyn is the co-founder of The Rookies and Tyroe.com, a recruitment platform for digital artists. www.therookies.co



"The Rookies has categories from traditional to tomorrow. This means that people can submit illustration and concept art, all the way up to virtual reality and even robotics," explains co-founder of the awards, Alwyn Hunt. "Our winners get propelled into the industry, they get strewn all over the internet and get a red carpet introduction into their career of choice. Aside from all the prizes and internships, the bottom line is that the winners get some serious recognition at an industry level. They instantly get some street credibility and take a few massive steps up the career ladder."

FYI To enter The Rookies, head to the website: www.therookies.co





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SHORT CUTS

IT'S ALL BLACK AND WHITE

Between Walls, a strikingly stark and strangely beautiful short, created by students at The Animation Workshop, evokes a unique visual world

SARA JESPERSEN HOLM

Sara graduated with a Bachelor of Character Animation from The Animation Workshop in January 2016. Sara works as a film director, writer and animator..
www.vimeo.com/150113247



Mellem Væggene (Between Walls) was made by a team of students at the Danish school, The Animation Workshop.

The short focuses on a father-daughter relationship; where childhood innocence and creativity are represented by the white birds, and self-doubt and creative blocks are represented by black birds. The lack of colour in the short and the masterful staging work really caught our eye, and contribute to the conflict, creating a unique mood and tone. We caught up with director, Sara Jespersen Holm, to ask her more about the short's technical aspects and influences: "Stylistically we were inspired by theatre and especially by late Czech stage designer Josef Svoboda. We loved his grand yet simple set designs. We wanted to contrast the surreal world with the down to earth and bleak social realistic Danish cinema."

What was the hardest job?

I think the hardest job was being able to understand the CG pipeline. There were many unforeseen challenges and because we were students we were constantly learning by trying, failing and trying again.

Can you talk us through your pipeline?

Our main software was Maya, which is the standard at the school for CG work. Maya was used for modelling, rigging, light set up, animation and so on. The black birds were fully rigged from scratch by our technical director Casper and given a flat shader so they would appear 2D. Our art director Sara worked a lot with Photoshop for her concept work and later for matte paintings. For



the 2D animation of the white birds we used TVPaint and used a very painterly brush to contrast with the sharpness of the black birds. Mari was used for texturing. We sculpted the characters in ZBrush and for compositing we used Nuke. For production management we used Shotgun, which is a great tool for keeping track of the overall plan and deadlines. The film was edited in Premiere Pro.

What was the most impressive technical aspect and how was it achieved?

The entire set was built on a rotating platform in Maya. The set was simple; it was created out of walls that were turned towards the camera on different rotating rings. Whenever we wanted the walls to move we simply rotated the desired ring. This way the walls would always stay with the front towards the camera and we would easily be able to change the set and arrange the walls. By setting it up like this, we could easily work with different staging possibilities

until very late in the pipeline with the camera and edit locked.

What lessons did you learn?

Being a student production we all had different skills and had to learn as we developed the film. This meant that there were many parts of the process that we simply did not know about and therefore had a hard time planning. It felt like we were always a week behind, but this forced us to keep trying to simplify where possible.

What's next for you?

I'm working on my next short, Spectrum, at Open Workshop in Viborg. It will be a mixed-media project with elements of live action with green screen, 2D animation and set extension with matte paintings. Sara Aunbirk will also be the art director on this project and we will actually be building on the visual look of Mellem Væggene.



Watch Between Walls online at
www.vimeo.com/154990348

VITAL STATISTICS

TEAM

Director

Sara Jespersen Holm
Other contributors
Agnete Maltha Winther,
Sara Fenya Aunbirk,
Casper K. Christensen,
Anne Birk Petersen,
Louise Gregersen,
Stine Dalsgaard
Andersen,
Frederikke Berg,
Camilla N. Anderson

SOFTWARE

Maya, TVPaint,
Photoshop, Premiere
Pro, ZBrush, Nuke,
Mari, After Effects,
Shotgun

PRODUCTION TIME

10 months

By setting it up like this,
we could easily work with
different staging possibilities
until late in the pipeline with
the camera and edit locked

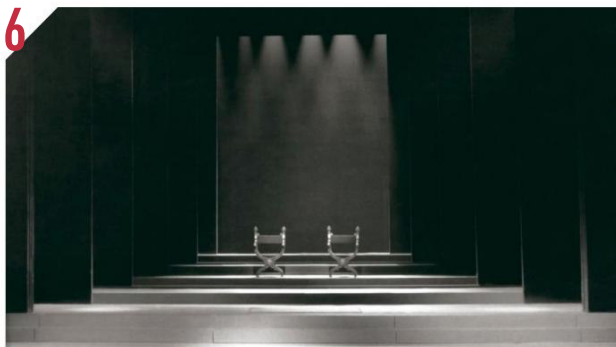
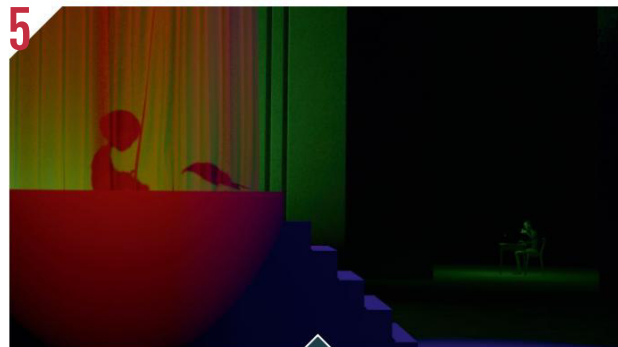
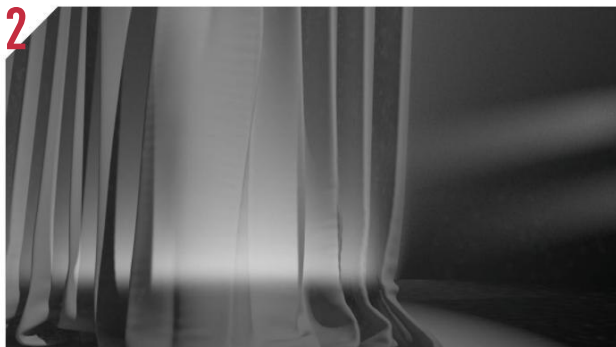
1 The black bird was rigged in Maya. We discovered that birds are hard to rig and it became very heavy so we needed a proxy version for animation.

2 We used cloth simulation for the curtain. It took time to get the desired transparency and make it move the way we wanted it to.

3 We focused on the staging of the set and characters and the mood in our concepts. Light and shadows play an important role in the short.

4 Initially, we set up a simple light in Maya and then we matte painted the desired look in Photoshop, and then recreated it in Maya and Nuke.

5 To save time in compositing, we used different coloured lights. This scene is an example of where we used this technique to great effect.

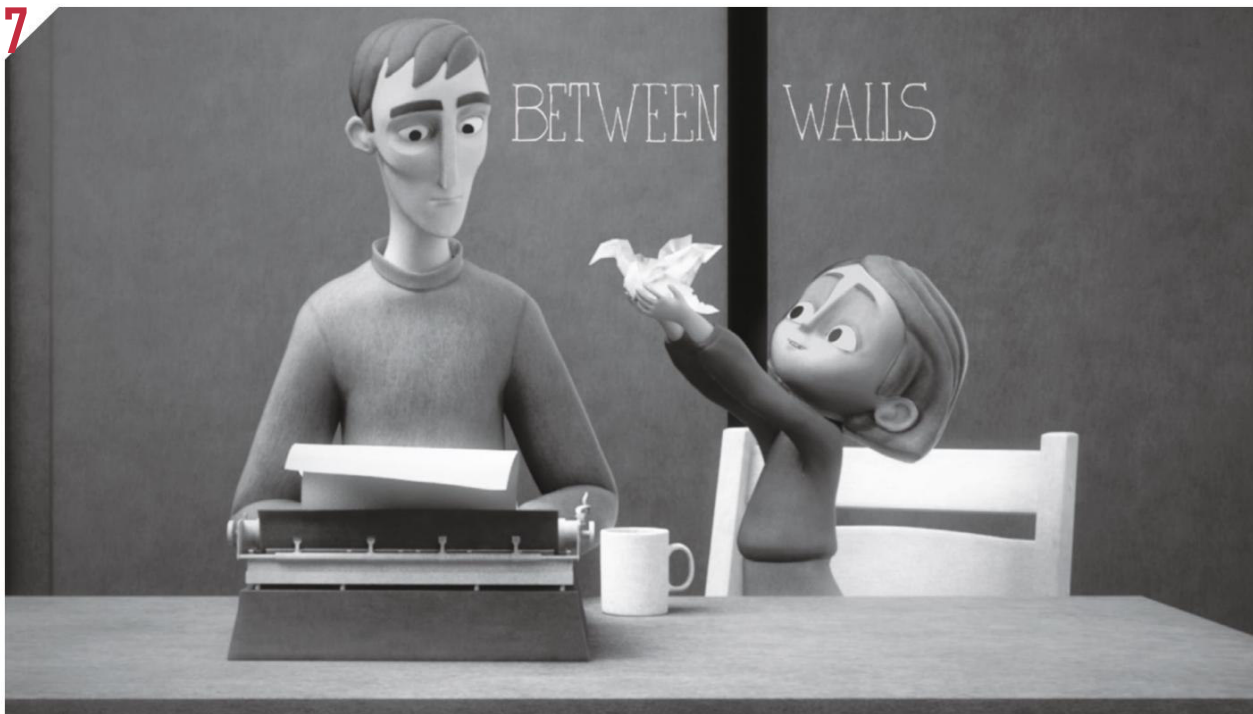


RENDER LAYERS TO THE RESCUE

For each shot we rendered two or three light setups using red, green and blue, to shuffle the RGB passes out later in compositing. This enabled us to animate the intensity for different colour groups in comp rather than having to spend lots of time rendering, or having to re-render shots. As light plays a big role in the short, we wanted enough time to try out different things in compositing. We did not know about this process before starting the project and we were able to do this because the film was made in black and white. Rendering always takes a lot of time; by having render layers we had to do fewer re-renders and in the end it saved us a lot of time.

6 Josef Svoboda was the biggest visual influencer. He was brilliant at playing with light and shadow; creating beautiful staging with simple shapes.

7 We created a few simple textures in Photoshop, some of which were hand painted. We then applied the textures in Mari.





Nvidia's VCA could become a service, replacing the render farms we currently utilise

HARDWARE NEWS

HANDS ON WITH THE NVIDIA VCA

Rob Redman gets to test Nvidia's GPU powerhouse, and is left impressed

Nvidia's VCA is a rendering system in a box. Essentially a box full of Quadro graphics cards, but in reality far more. You may have tried stacking a handful of PCI cards in your workstations in a bid to speed up rendering, but there are limitations to this in the form of compatibility issues, heat and power control, as well as the inherent cap on card count. This is where VCA succeeds. As a one-stop solution the chassis and underlying architecture are what counts, supported by a minimum of 192GB ram and 16 threads of CPU power. The box itself runs linux and comes pre-installed with V-Ray RT and Iray.

LEE DANSKIN

Lee is chief technology officer at Escape Technology and has over 25 years of experience in the high-end graphics business within M&E. He was awarded Maya Master status in 2007. www.bit.ly/208-danskin



"It's fast," exclaims Escape Technologies' CTO Lee Danskin. "I'd love to tell you more, but when you're talking about the VCA that's the bottom line: it's incredibly fast."

Running V-Ray RT in Maya 2016 you can get an almost real-time render at full quality of even dense, multi-mesh scenes, with full GI, blurry reflections and multiple transparent shaders. Once sent to the VCA the render itself is blisteringly fast. One example was a scene with 18 million polygons, which rendered clean in under 10 seconds.

A large benefit of using VCA is the scalability of its architecture. You use the network based manager to tell it what resources you want to use and that's it. You can share the system between different artists, teams, or even locations, and as it's server based you can share the output with anybody who has an internet connection.

Build your own solution

This means you could, if you were running a larger studio, have multiple VCAs set up, which would be a massive reduction in costs and resources. On top of that is the fact that certain other CPU tasks can be handled by VCA; all those cores can be thrown at running simulations such as Bullet physics.

One possibility too, is the DIY solution. It's possible for smaller houses and single artists to bypass the hefty financial outlay and self-build their own solution, which could conceivably reduce the cost from the £30k to £10k, which is actually not far from the cost of many high-end workstations.

It's early days yet but with studios adopting VCA already it looks promising, especially as developers are turning more often to harness the power of GPUs, leaving the CPUs to manage the rest of the system.

FYI For more information on Nvidia's VCA visit www.bit.ly/nvidia-vca

SOFTWARE NEWS

Some new releases making headlines

THE GROVE 3

The tree-creation plug-in for Blender features some good updates, including more realistic tree branch growth and smoother blending of each branch with its parent. And in more Blender news...



BLENDER 2.77

Out now, the latest version of the open source software adds improvements to the Cycles renderer and animation tools, including the Graph Editor, Dope Sheet and Armatures. Info and download options here: www.blender.org/features/2-77

VISUAL DESIGNER 3D

There's a free trial available for this new real-time renderer that supports both CPU and GPU rendering, find out more here: www.vd-3d.com



When using the VCA rendering a scene becomes incredibly fast

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EXPERT PANEL



Pietro Chiovaro

For the last few years, Pietro has worked creating 3D assets and environments, and is currently working on an open-source game.

www.bit.ly/pietro-chiovaro



Francesca Forzoni

A 3D artist/visualiser in London, Frankie recently moved from post-production to branding and packaging and currently works at Design Bridge.

www.francescaforzoni.com



Zeno Pelgrims

Zeno is a CG student with a passion for animation and VFX. He is currently finishing his last year at the NCCA, in Bournemouth, UK.

zenopelgrims.com



Cecilia Piemontese

Cecilia is a freelance animator and illustrator. She has produced music videos, adverts, content for the web and moving image presentations.

www.ceci.tv



Rob Redman

Rob runs a 3D animation and VFX studio, working for clients ranging from governments to rock stars. He's also an industry commentator and trainer.

www.pariahstudios.co.uk



GET IN TOUCH

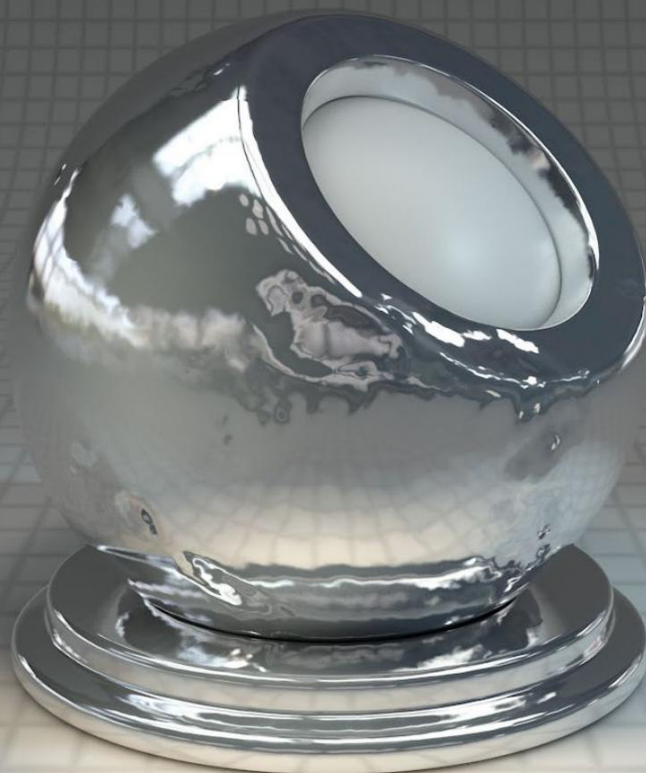
EMAIL YOUR QUESTIONS TO
ian.dean@futurenet.com



ARTIST

Q&A

Your software queries solved by our CG experts



How do I know my materials will look right in the final render?

Phillip Verbosey, UK



Rob replies



This is a very good question and the answer deals with a few aspects of material creation that are really important to producing believable renders. The overall answer is a combination of things, but the main part would be to have a standardised method for creation that you stick to, allowing you to always work in a predictable situation. This will support your ability to recognise faults that lie elsewhere in your scene, such as lighting or render settings.

The trick here is to set up an object that can cater to different types of material, from solid surfaces to transparent or translucent ones. Usually a sphere with some detail works well and, in this example, I have a ring beneath the surface to help when working with SSS.

Other elements you will need to make this scene work are an environment, which should have something that can show in reflective materials. I actually use a combination HDRI on a sky dome as well as an image-based spot light. This means I can turn light sources on and

Set up your scene using a known scale and create your materials based on this scale

off, which is great for when you're working with light-emitting materials.

When it comes to the lighting on the scene it is more important to get simple but variable options so you can easily deal with different render requirements. For example, if you find yourself working on a project that doesn't have a GI solution, you will want to switch to a procedural lighting setup, using your host software's procedural lights, which may or may not include falloff.

These days it's more common than not that you will be using a linear workflow, but keep in mind that you may not. It's worth having a duplicate of the material setup scene for this, as turning it off will have quite a few knock-on effects for your materials.

Next, and in some ways most importantly, there is the element of scale. I talk about this a lot in my classes and training articles and it is becoming more and more important as we move to ever more physically accurate render solutions.

Set up your scene using a known scale and create your materials based on this scale. A metre is a good middle ground and caters well for everything from product design to architectural visualisation. Having a grid in your studio is a good way to help reinforce this, but keep it mid-grey to avoid it skewing your material work.

Finally there are the physical attributes. Most apps let you specify things like refractive index and Fresnel settings, and even IES profiles; so a quick search can help bring the most realism to your work.

STEP-BY-STEP MATERIAL CHECK

ONE SCENE BASICS

The first thing you need to do is build a scene for your material creation. I tend to use a simple cyclorama-style studio in Cinema 4D, with the grid on it for scale reference. Then you need the actual reference object. I'd opt for an adapted sphere, with an internal object and a base with sharper edges. Choose a size that's easy to work with and allows for tiling.

TWO LIGHTING RIG

Next, you need a sky with your chosen HDRI applied. As mentioned you will probably want to set up a couple of image-based lights as well as procedural ones. Adding the image-based lights to parametric geometry will make it easy to activate/deactivate them as needed, saving on scene management while you work.

THREE RENDER SETTINGS

It's hard to dictate what the appropriate settings should be, but I'd suggest saving a few presets, one for each type of situation you think you might work in, such as different GI types, AO passes and even NPR types like Cinema 4D's Sketch and Toon. Working like this means you save time and retain consistency, plus you don't need to record or remember your settings.

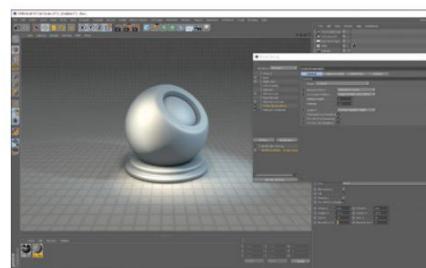
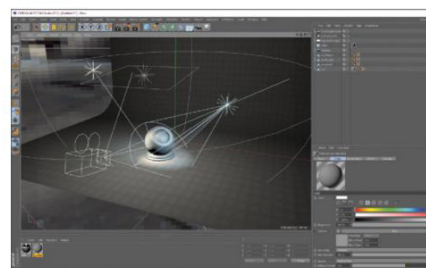
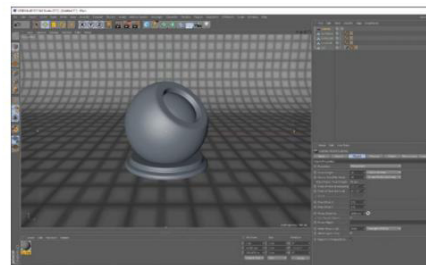
FOUR BASELINE RENDERS

It's probably a good idea to make a library of materials, rather than creating them ad hoc, and a good place to start is with a few basic materials that you will use most often. These will most likely be metals, woods and so on. This not only means you'll have a solid collection, but also gives you a great baseline for comparison.

EXPERT TIP

Teamwork

If you only ever work on your own you can do whatever works for you to get the results you want, but increasingly software is requiring us to work with physical settings. This makes it easier to create photo-real results, but also means that sharing assets is more likely to result in consistency across teams and projects.



EXPERT TIP***Don't rush your sculpting***

Take your time when sculpting organic objects such as liquids. Use sculpting or the Soft Selection tool to morph the liquid shape slightly, and add noise into your reflections of the liquid metal material to add the appearance of texture. Look at how metal and liquids sit on the surface they're on differently. Do your research and find some real life imagery.



How do I create a realistic liquid-metal effect?

Jamie Ressaland, US

**Frankie replies**

I would begin by finding images of melted metal, liquid spills and drips of paint for reference – it depends how you want your drips of metal to look and how thick/thin you want them. I just grabbed some images from Google and Shutterstock with liquid splashes in interesting shapes. From there I took each one into Illustrator and drew around the outline of the splashes using the Pen tool. Then I saved them as Illustrator 8 files and imported the outlines into Cinema 4D. You can just as easily use your splash images as a back-plate in C4D, and use the Pen tool within C4D itself to create your outline – it's purely down to whatever you find easiest!

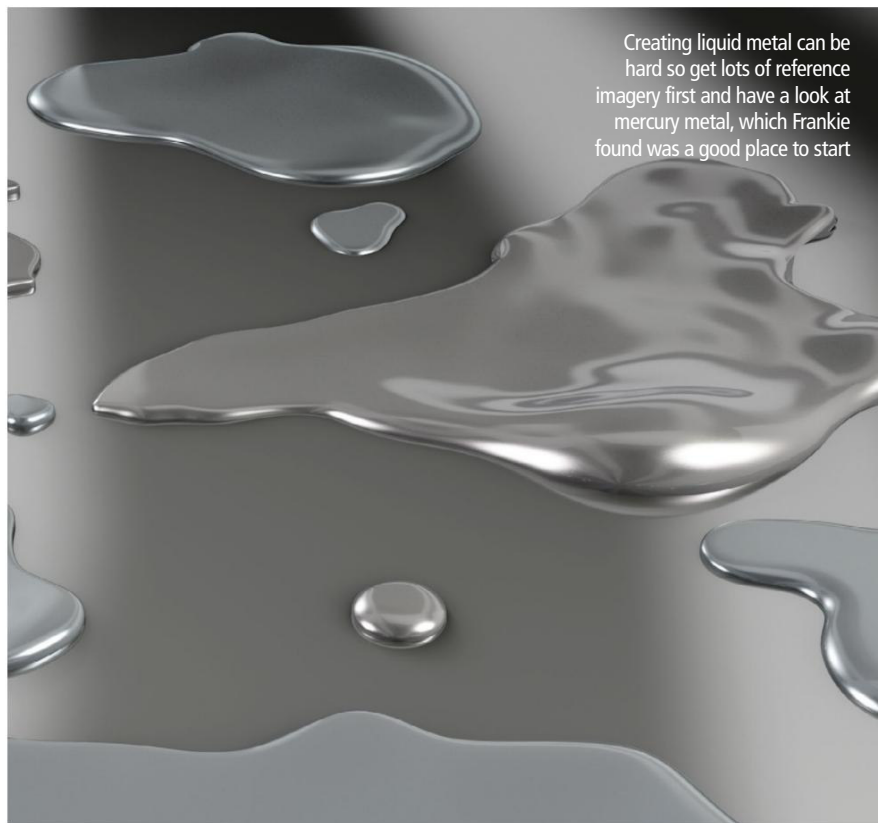
Once you have your outline in C4D, you just want to extrude it and pop a cap onto the front face. I then brought this extruded shape into ZBrush to start sculpting into it (again if you feel more comfortable sculpting straight in C4D, then you can do that!). I found the Inflate tool was really great for this project; I used it to create a thick inflated edge around the lip of the metal so it sat on top of the surface it was on nicely.

I used the Inflate tool to create a thick inflated edge around the lip of the metal so it sat on top of the surface nicely

You can get some great highlight detail here too once everything is all textured and lit. Repeat this process for each spill or you can take a few at a time if they sit well together in a group.

You can continue to sculpt into your meshes within C4D until you're happy with the results. I also found the Soft Selection tool was a great help to tweak the shapes of the spills. Select Vertices selection mode and tweak the Radius and Strength of the Soft Selection tool to effortlessly change the shape of your model whilst still maintaining your smooth sculpted mesh.

Once you've finished sculpting, add lights and textures to your scene. You can use the preset Car Paint material within C4D (it's a great starting point for your liquid metal texture), or you can create one from scratch. Add some noise into the Reflectance channel to add some discrepancy to your highlights. Try a few interesting HDR images and several sources of lights to really help show movement across the liquid, and show the thickness of the melted metal.



Creating liquid metal can be hard so get lots of reference imagery first and have a look at mercury metal, which Frankie found was a good place to start

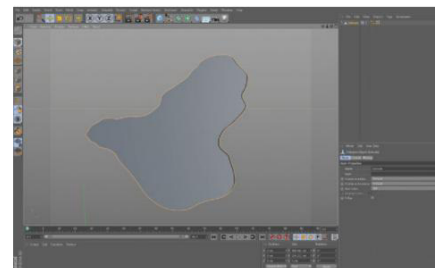
STEP-BY-STEP CREATING LIQUID METAL

ONE FIND REFERENCE IMAGERY

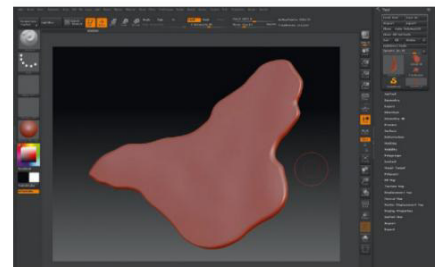
The first thing to do is an internet search to find reference images for liquid metal – try searching for mercury metal, paint splashes and spilled liquid. Try to get a selection of natural, interesting shapes and sizes. Bring these images into Cinema 4D or Illustrator and create a library of splash outlines ready for you to extrude in 3D.

**TWO LET THE SCULPTING BEGIN**

In C4D, you want to extrude each group of outlines and add a cap onto the front of each mesh. You then subdivide and start sculpting within C4D or ZBrush. Use the Inflate and Smooth brushes to create the most organic shapes. Experiment with how thick or thin you want your pools of metal to be – keep looking at your reference images to check it's looking real.

**THREE TWEAK THE POSITIONS**

Once all melted metal meshes have been sculpted, place them onto the surface you want them sitting on. If any edges aren't sitting the way you want, select the vertices and use the Soft Selection tool to pull the edges onto the floor or to tweak the outlines of the spills. This method gives you a lot of control whilst still maintaining your smooth sculpted mesh.

**FOUR FINISHING TOUCHES**

Once you're happy with your models, introduce your metal material and start playing around with HDRs and various light setups to really show off the smooth curved edges of your melted metal pools and any thickness you've added. You want your metal to look as natural as possible, so the more hints of sculpted detail and noise within the reflectance the better!



EXPERT TIP

Different parameters

When you are going to fix the value of the world volume density, make some renders using different parameters. In this way you will understand which value will help you to achieve the right density for the lighting and this will also help you to achieve the best result.



How can I create a diffuse light?

Bingwen Pinyin, China



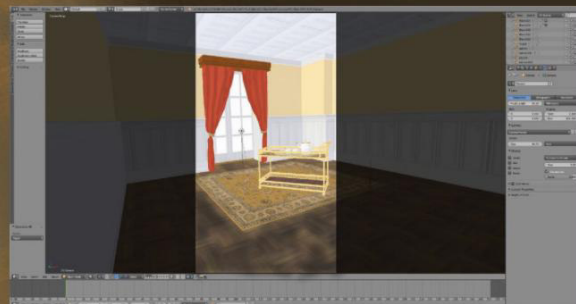
Pietro replies

One of the elements that characterises this render is the lighting. To create this effect, we have to set the scene. The first decision to make is to choose the typology of the light: In this scene I used a Spot light and a Point light.

The value of strength for the Point light, that I placed at the centre of the scene, is 100.000, and the strength of the Spot light, that I placed outside the room, is 200.000.000. All of these values depend on the scene that you are going to create, and, in particular, on the value of density that you fix in the 'world volume' of the scene. The world density it is the main element to create the light beam. In order to create this beam we have to select the World panel in the Properties window and then click on the panel Volume. Select Volume Scatter and change the Parameters of density to a value between 0.10 and 0.150. In this scene, I fixed a value of density of 0.300 to give more importance to the light beam. Doing this unfortunately increases the rendering time, but it is essential for the final result. Now if we want to give more realism to the lighting, we have to fix some nodes in the Compositing Nodes, with which we can define the final image.

To create this beam we have to select the World panel in the Properties window and then click on the panel Volume

In this scene I used a lot of nodes, but the essential ones that we have to use in a scene (where there is a diffuse light) are the Glare and the Lens Distortion nodes. The first one can be used to add extra bloom to highlights in an image, the second one is used to simulate special effects in the lens. All the parameters for these two nodes depend on the scene in which you are working. In this project, I fixed these parameters in the Lens Distortion node and I selected the Projector, then I fixed a value of Dispersion equal to 0.050, and for the Glare node, I fixed a value of Fade of 0.750, a value of Mix of -0.700 and a value of Color Modulation equal to 0.600; for the other parameters I left the default values.



After you have finished rendering, you should use a photo-editing software, such as Photoshop, to further refine the image

EXPERT TIP

Camera movement

Spend time testing different camera angles and getting the camera movement just right for your shot. Adding a camera shake will give your animation a touch of realism and provide a follow through reaction. Here I have added a slight jump to the camera in response to the horse hitting the snare drum.



How can I animate a quadruped to perform a human action?

Hamish McArthur, UK



Cecilia replies

Animating a quadruped to perform a human action is a task that requires a good understanding of the motion you need to imitate, a grasp of the differences in the anatomies and some inventiveness to make the action believable. Here I have animated a horse playing drums in time with music.

The main challenge is to balance a quadruped in a position that is unnatural to the character, like sitting down on a chair, and animate the movement you are imitating so that it looks effortless and plausible. It is important to strike a balance between imitating the human motion and creating an animation that is not totally unfamiliar to the characteristics of the animal. Think about the way quadrupeds move and what they have in common with the action you want them to perform. What part of the body can help you communicate this more directly?

Gathering reference and analysing the motion you need to create is the first step to success, the next is to understand the limitations of your rig. Quadrupeds do not have elbows that point out or move freely like humans, instead their

As the sticks hit the drums, the horse's head drops down and the mane follows the movement conveying the force of the impact

elbows are fused with the torso and wrapped in the skin that extends from the chest. This was particularly problematic as the elbows of a drummer have a major role in transmitting the force of the action.

It is fundamental to find out what the strengths of your character are and to utilise them as much as possible to balance out the weaknesses. Horses have very long necks – visually necks take up to almost a third of their length. I spent most of the time animating the neck and getting it just right, trying to make it look as natural as it would in a gallop.

Introduce devices to aid your quadruped through the motions it is not naturally able to perform. Here I have modelled and rigged tape to wrap the drumstick around the horse's hoofs. Finally, utilise the parts of the character that can help you describe the motion more clearly. In this example, the mane is a key helper. As the sticks hit the drums, the horse's head drops down and the mane follows the movement conveying the force of the impact.

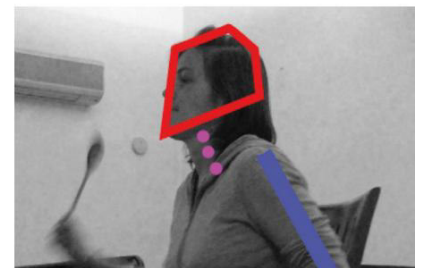
The final animation of the drumming horse can be found on my website: www.ceci.tv/?/3D/project-2.



STEP-BY-STEP BRING YOUR CHARACTERS TO LIFE

ONE REFERENCE

Studying the movements of the action you need to imitate is the key to success. Watch YouTube videos or make your own. In this case I recorded myself and friends drumming to understand the subtle movement of the neck. With compositing software you can track the elements you recorded in order to figure out the kind of circular motion you need to replicate.



TWO NUMBERS

Analyse your reference videos and watch them in slow motion. Take notes and write down the number of frames an action takes from the start to finish. For example, the left arm takes two frames to hit the drums, 14-15 frames to go back to position and four to five frames to rotate the wrist in position to strike again.



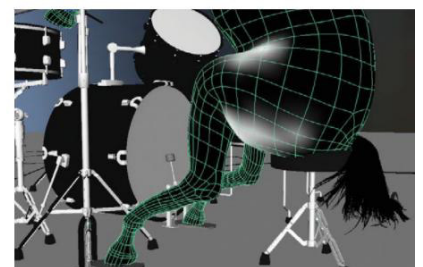
THREE SIMPLICITY

Keep the Graph Editor as clean as possible and delete unnecessary key frames. Every time I find myself in a difficult situation I retrace my steps and start afresh with fewer key frames. Choose the right moments to convey force in the animation and remember to follow the concepts of anticipation, exaggeration, action and follow-through.



FOUR JIGGLE

Animating the jiggle on the flesh of your character is a great way to convey force and to bring the character to life. Just add an Influence Object to the rigged model and paint an influence of 0.3 on the part of the model that is going to be affected. I personally prefer to animate manually, instead of just copying the key frames, so as to add some variety.





How do I correctly combine sculpted and painted displacement maps?

Emma Strange, US



Zeno replies

Sometimes it is more efficient to combine various Displacement maps at render time, rather than sculpting all of them. A common example is when you're creating fabrics, a skin shader, or in this example, paint splatches. I would sculpt a Displacement map in ZBrush, but leave out the high-frequency details; sculpting just the big shapes. I prefer to paint the high-frequency details (for example, paint drips or skin pores) in 2D so I can use the same information in my Colour map. It also enables me to go

into much more detail. I'm not bound to my eight to 12 million polygons in ZBrush, for example an 8k map has 67 million pixels to exploit. So we end up with a 32-bit Displacement map with a practically infinite value range and an 8-bit image with a value range between 0 and 1. So how do we combine these? It's really easy with Arnold: first you need to remap the painted Displacement map so the Scalar Zero values of both Displacement maps are the same. When dealing with 32bit extracted Displacement maps, this is usually 0. The zero value shifting is needed for

correct layering of the maps. We will use the alRemapFloat for this. Leave the Bias and Gain as they are; just change the Output Min and Output Max to -1 and 1. Be sure to disable clamping. We can't clip half our information in the negative values. Then all that's left is to layer the shifted 8-bit map on top using an alCombineFloat node using the Add Operation. To control the intensity of the layered map, we can both adjust the Output Min and Output Max values in the alRemapFloat node, or we can create an extra alCombineFloat node and multiply the map with a certain value.

Diffuse extra samples -2
SSS extra samples -3

Zeno believes that keeping track of your samples is the key to speeding up your renders

CLICK TO PLAY VIDEO
www.bit.ly/208-arnold



EXPERT TIP

Using the alSurface shader

The alSurface shader allows for under and oversampling of all aspects of the shader – valuable when optimising scenes. Imagine you have two sub-surface scattering shaders; one using the cubic model and another using the directional model. The latter needs more samples to clear up the noise. It's better to add samples on the shader level rather than in the global settings, since otherwise the cubic model would receive more samples than needed.

FEATURE

Making The Little Prince

A SENSE OF WUNDER

Trevor Hogg discovers how the much-loved children's classic *The Little Prince* was given its animated overhaul



nce you've made one of the most-loved CG animated movies in recent years, what do you do next? For filmmaker Mark Osborne, you tackle one of the most well-loved children's books of all time, *The Little Prince*

by Antoine de Saint-Exupéry... and you do it by mixing CG and stop motion.

MARK OSBORNE

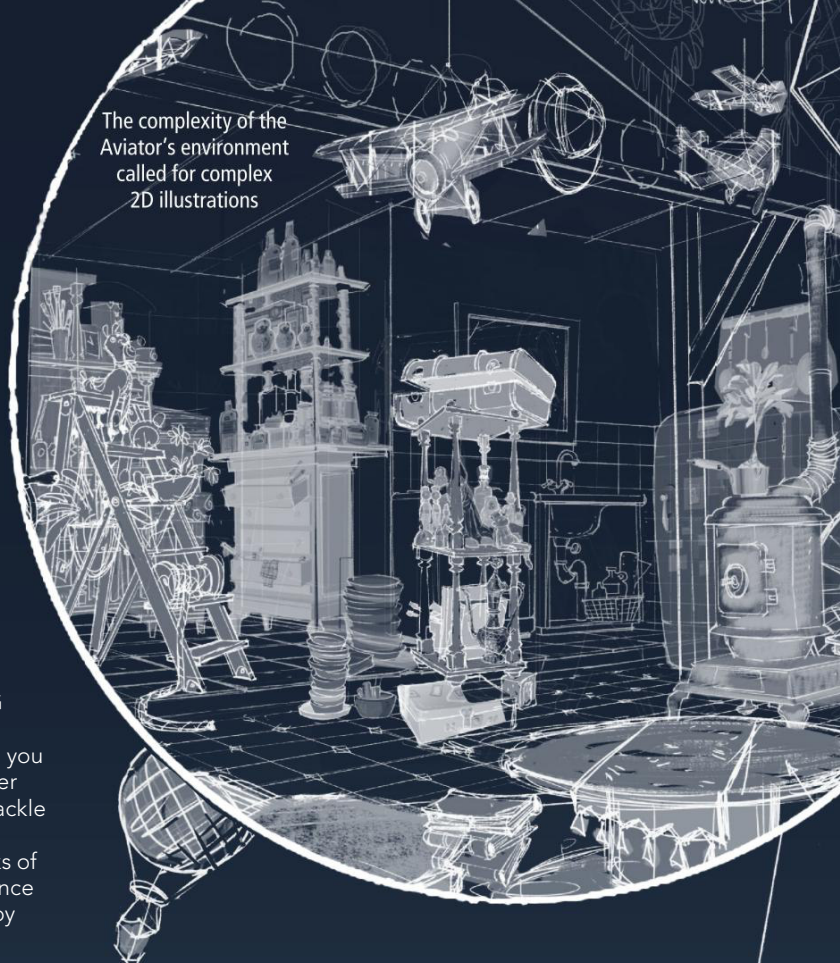
Mark is a two-time Academy Award nominated director.

His credits include *Kung Fu Panda*, *The SpongeBob SquarePants Movie* and *The Little Prince*.

www.bit.ly/208-osborne



"Originally, I was asked to make the whole movie in CG," explains American filmmaker Mark Osborne (*Kung Fu Panda*) when discussing the cinematic adaptation of *The Little Prince*. "I came back with the idea of using CG to tell a larger story and to have stop motion for the sequences from the book." The contrasting animation techniques would represent the overriding theme that explores reality versus imagination



The complexity of the Aviator's environment called for complex 2D illustrations

We got to do a final camera pass with a hand-held camera, which gave an extra level of intimacy and feeling

and the differences between the worlds of adults and children.

"Guerilla Render is a lighting package that was a great solution because it gave us lighting properties for the CG that would match better with our stop motion lighting," explains Mark. "They were so separate so we chose light and colour as the elements that were going to relate the two worlds." Maya was the chosen software for the animation: "We didn't have any proprietary software so it was the best way to be up and running the quickest," he continues.

Key scenes

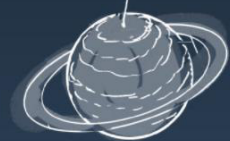
Mikros, based in Montreal, handled all of the CG scenes, including one of particular emotional significance. "We're coming out of the sequence where *The Little Prince* decides to leave *The Fox* and to go back to his rose," states Mark. "The Aviator is trying to make sure that *The Little Girl* understands this story as it will eventually help her to cope with the fact that he isn't always going to be there for her. We were trying to create a supportive, emotional and nurturing

environment for this pivotal relationship and moment between these two characters who need this bond to be strong."

"We had a concept painting for this location and for the relationship between the Aviator and *The Little Girl*, which specifically came into play for this sequence," recalls Mark. "Both storyboard artists who worked on it were animators so they brought a lot of subtly to the acting. It was clear, not only in the staging, but also in the hand-drawn panels." Most of the adjustments that took place were with the setting. "The Aviator's house is a cluttered location filled with a lot of materials and artefacts [inspired by travels of Antoine de Saint-Exupéry]. The overall feeling that my production designer Céline Desrumaux was trying to create of the space was that of a cocoon, a very warm and safe place."

"There's one major light source and that was in the original concept painting," states Mark. "The Aviator has a big window he is sitting in front of where all the light is filtering in through the trees in his backyard. It's beautiful warm sunlight."

The light also influenced the animation design, as Mark explains: "It was important for the environments, props and characters to be highly stylised so the realistic atmospheric lighting would not become ugly photoreal."



FEATURE

Making *The Little Prince*



Depth of field was employed so that viewers could stay focused on the characters, as the location had significant detail

Room to move

The number of assets that needed to be created had a real impact when selecting the various angles. "Whenever we made adjustments to the camera it would have an effect on the whole pipeline," says Mark. "We got to do a final camera pass with a hand-held camera, which gave an extra level of intimacy and feeling, so there's a real human touch to that sequence. We have a static camera for *The Little Girl* when she is in the house. Whenever we are with the Aviator the camera floats, the lenses are wider, and there's a feeling of lightness rather than rigidity."

"Depth of field was used to help you stay centred on the characters because the location had so many details and it's such a rich environment," states Mark. "If everything was in focus it would be difficult to connect with the characters. I love using depth of field in CG as it feels more like a miniature as opposed to realistic live-action. It helped to create a sense of scale and being in a slightly surreal environment." And atmosphere plays a big part in the imagery. "It's one of the few sequences where we

have volumetric lighting and dust particles in the air which gives another layer of believability."

No motion capture was utilised by Mark. "The animators created a performance based on the nuances and subtleties heard in the voice of Jeff Bridges." But the wise old man has a distinguishable physical trait. "The most difficult thing about the beard was getting the groom to look just right. If that beard is a little bit too dark the Aviator looks creepy and if it's too bright and white he'll look like Santa Claus. The beard was intended to appear soft and inviting. In regards to *The Little Girl*, we wanted her eyes to be big because it was evocative of a child," he explains.

Keep it real

"We kept the motion of the characters realistic," notes Mark. "Rarely do they move in a cartoony way. Especially in this sequence, it's all about subtly so there's not a lot of extreme motion." Stationery plays a role in the colour palette. "The clearest visual aid to understand who the Aviator



It was important to Mark Osborne to keep the motion of the characters realistic, so they didn't move in a cartoony way

DESIGNING THE AVIATOR

Mixing reality and stylised design proved a challenge

When it came to designing and rendering the character of the Aviator, director Mark Osborne and his team met some unique challenges.

"The surfacing of the Aviator needed to be stylised, yet believable," says Mark. "Many tests were done to try and create something that felt like it had history and a real visceral organic quality."

The character look development supervisor on the film was Stéphanie Baillod, who managed to create a subtle mid-ground between a cartoon character and a realistic old man who viewers can relate to emotionally.





Mark Osborne says the team were trying to create a supportive, emotional and nurturing environment for the relationship between The Little Girl and the Aviator

is, is to think of a piece of paper that used to be white and is golden amber with age." The hope was to create something that felt like a storybook. "The subtle tweaks of colour and subtle tweaks at the compositing level at the final stage were essential to the final look of the movie."

"It was expensive to change anything in our pipeline," recalls Mark. "It took a lot of guessing. It was great when all of the pieces came together and you could get to where you needed to get to." The native of Trenton, New Jersey, is quick to acknowledge the contributions of CG animation supervisor Jason Boose, animation leads Marc-André Baron and Ludovic Roz, who perfected the Aviator as well as the collaboration between production designer Céline Desrumaux and CG lighting supervisor Adel Abada who brought life to home of the Aviator. "When I look at the original concept painting and at the final sequence, I feel like we achieved what we were looking for."

FIL Watch the trailer for *The Little Prince* here www.bit.ly/208-prince

PERFECTING THE COCOON

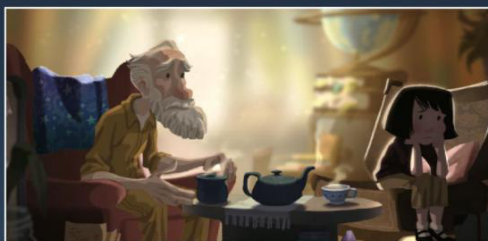
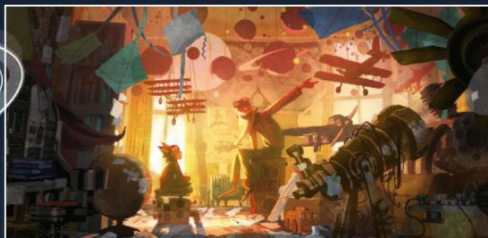
Bringing the complex scene together

Key to selling the idea of the Aviator, this well-travelled, aged adventurer was creating his home, filled to bursting with remnants of past adventures and echoes of flying machines. The aim was to create a warm, cluttered, comfy space.

"The final look in CG was a balance of creating the cluttered cocoon, filled with warmth and light, while keeping the dark mysterious corners to give a sense of depth to the space and history of the character," reveals director Mark Osborne. "Lighting supervisor Adel Abada worked with CG super Pascal Bertrand and co-production designer Céline Desrumaux to perfect this incredibly complex setup."

DESIGNING A DREAM HOUSE

Director Mark Osborne reveals how the Aviator's house developed



CAPTURE A FEELING

This was the first painting that was created by Tang Heng that showed the warmth of the relationship between the characters, and also created a safe cocoon space for them to share the story of *The Little Prince*. Capturing this feeling became the goal of the entire production.

DESIGNING FOR CG

This is an illustration created by Mathieu Gosselin in order to try and establish a more concrete depiction of the space that had been previously suggested in Tang Heng's painting. This was an important step in terms of trying to get the very complicated and cluttered space into CG.

DEFINING EMOTION

Next in the process was this mood painting created by Lou Romano. He was seeking to define the range of emotion needed in the scenes that take place in this space, so that we could be sure that all the architecture, props, textures and lighting could help us tell the story we needed to tell.

COLOUR PASS

Next came Céline Desrumaux's local colour pass, helping to define what the overall colour palette that would be assigned to the many objects in the room. This is an important stage that helps to break apart the clutter of the scene and retain the emotion and design created in past steps.

SET THE ANIMATION

With rough set dressing in place, next was the animation of the characters. It was crucial to have the connection between the characters feel real, and subtle acting was used to make this tender moment feel genuine. The animation supervisor was Jason Boose, and the shot was animated by lead animator Marc André-Baron.

DRESSING & SURFACING

Some colour, rough surfacing and lighting was added to the set to see how its general look was coming along. It's a very complex location, so there had to be many iterations of the dressing and surfacing, to ensure we wouldn't end up with visual mush. Props and sets look development supervisor was Vincent Tonelli.



ARTIST PORTFOLIO

PER HAAGENSEN

*Concept artist **Per Haagensen** reveals how moving to ZBrush and Maya helped his career*

This Catwoman clay sculpt reveals Per's deft use of camera angles to grab the perfect superhero pose



Concept artist and illustrator Per Haagensen has made the leap from traditional art to 2D digital art, and now embraces 3D modelling to bring his work to life. The Norwegian artist sees links between all disciplines, embracing different software and workflows to bring the most to a project.

ARTIST PROFILE

Per Haagensen is a concept artist and illustrator working at EA studio DICE. bit.ly/per-haagensen



"I don't really separate the experiences as I see 3D merely as an extension of my 2D toolbox – having an understanding of style

and design, composition, light/shadows and anatomy is applicable and crucial to any discipline of art," the artist explains.

"Working at a studio with so many other artists, be they 2D, 3D, lighting or VFX, has really been beneficial. It gives me a wider beacon to search for a solution to solving a concept task," continues Per, who says that working in a games studio where the final result is a 3D asset means adapting to 3D is vital.

Per began his 3D journey in LightWave, but nowadays, to keep the workflow quick and intuitive with his 2D conceiving, Per keeps the entire process inside one package – ZBrush. "As a digital painter I feel I can work very similarly in ZBrush, not getting hindered by technicalities... Other than that I do use Maya at the studio as well, since most of our 3D assets are in this format."

It's now also more common for the concept artist to work directly with the 3D artists and give them 3D concept meshes to work from, or we can take over a model and tweak details directly in a 3D environment rather than do a paintover," he explains.

Adapt and develop

In this context the merging of 3D into a traditionally 2D role meant Per had to push himself to adapt. "It is challenging sometimes to know how far to take the finish of the 3D model before rendering and finishing the



ARTIST INSIGHT

Pose your heroes

Per Haagensen says you need to focus on the technical aspects of poses

"Whilst I don't necessarily think there is the 'perfect' superhero pose, there is one thing I often see forgotten, which is making sure you take advantage of camera distance and angle of view. As important as accomplishing the dynamic, strong pose, getting the (virtual) camera right and set up in an interesting manner can be the key to a successful superhero pose."

I don't really separate the experiences... I see 3D merely as an extension of my 2D toolbox

concept with painting. Deadlines will dictate this to a certain extent but usually it is quicker to do certain things just with paint. Of course, the more detailed the 3D concept mesh, the less is needed to be explained in the concept painting."

Per is clear that adapting to 3D has been pivotal to his workflow and role as a concept artist, and urges anyone wanting to join the industry to focus on the learning: "I would say finding your place so you can focus on a skill which you can excel at and become a valuable asset to a studio," says Per as he adds: "I do also think it is important for you to want to become part of something bigger, be a team player and contribute whatever you can to achieve this goal. Ego really has no place in a good game development team."

FYI Find out more about Per's work by visiting www.bit.ly/per-haagensen

VITAL STATISTICS

JOB TITLE

Concept artist and illustrator

NOTABLE CREDITS

Mirror's Edge
Catalyst, World of Warcraft: Cataclysm, Battlefield 4, Age of Conan: Rise of the Godslayer

COUNTRY

Norway

The role

Per's adaptation to 3D software has been driven by his day job as a concept artist for DICE, with speed and clarity of ideas being a key factor in favouring ZBrush over Photoshop alone. Per shares a typical workflow... A short brief from the narrative director [ND] is turned into a moodboard of references and inspiration that will provide a base for discussion, which is then presented to the art director [AD]. More revisions and discussions continue before Per begins in earnest on creating a highly-detailed 3D model, while also refreshing the 2D paintings to hone the two side-by-side.

"At DICE the role of the concept artist is not only to produce pretty pictures, but to be an extension of the art directors," reveals Per, adding he must "assist them in helping the project achieve the art style and tone they have set. This entails producing concepts, references and moodboards, paint-overs and guidance to out our fellow artists and designers."

BANE (THE DARK KNIGHT RISES)



KILOWOG (GREEN LANTERN)



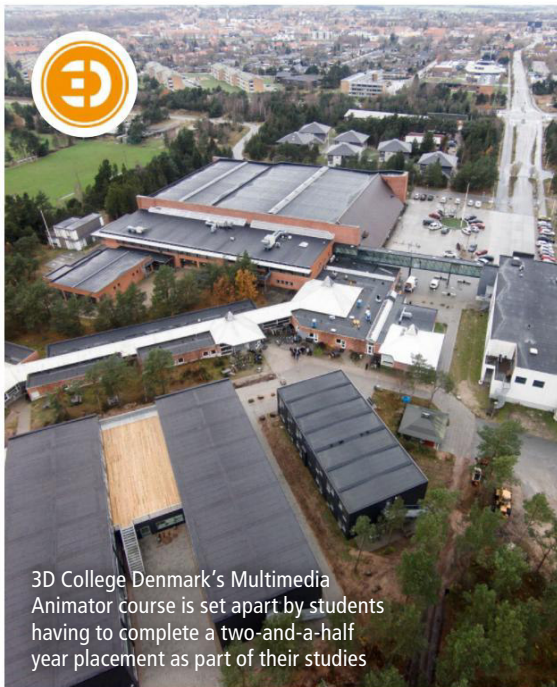
BATMAN (THE DARK KNIGHT RISES)



GET ON COURSE!



Discover the new CG, VFX and animation
courses you need to know about...



3D College Denmark's Multimedia Animator course is set apart by students having to complete a two-and-a-half year placement as part of their studies

3D COLLEGE DENMARK

WEBSITE: www.3dcollegedenmark.dk **COURSES OFFERED (IN-HOUSE):** Multimedia Animator **STUDENTS:** 90 **PLACEMENT RATE:** Approx 20% (with the rest going on to higher education)

3D College Denmark is the place to be if you have a passion for 3D. Located in Grenaa, one of Denmark's most beautiful natural resorts, the college offers expert 3D training delivered by experienced tutors.

Boasting an extensive network in the 3D industry, 3D College Denmark offers internships with a wide range of Danish game, VFX, visualisation studios and architects, most famously Kiloo Games, Lani Pixels, Cadesign Form and M2 Film.

"I think the fact that you have to stay and work at a company for two-and-a-half years to get into, and finish, the Multimedia Animator course really sets it apart," comments student Simon Holm. "The school also invites people from studios to do workshops, which really connects the school and us students to the industry. I would definitely recommend 3D College Denmark to anyone interested in getting a foot inside the world of 3D."

AFDA

WEBSITE: www.afda.co.za **COURSES OFFERED (IN-HOUSE):** BA Motion Picture Medium **STUDENTS:** Over 1,200 **PLACEMENT RATE:** Over 90%

An Oscar-winning institution, AFDA (African Film Drama Art) is the only African film school to win the Best Foreign Student Film award in 2006.

With over 1,200 students, AFDA offers a number of training courses in the creative industries, including Motion Picture Medium, in which you can learn VFX, including compositing, 2D animation, title and credit design, motion graphics, using typefaces, keying blue or green screen, motion tracking, rotoscoping, particle generation, grading or colour timing, 3D modelling, texturing, shading, painting, animating, rendering and visual effects supervision.

With a permanent staff of over 150 academics, AFDA creates a unique production environment for students, where everything – including film development – happens in-house. Boasting fully equipped campuses in Botswana, Johannesburg, Cape Town, Durban and Port Elizabeth, you'll benefit from expert training in beautiful surroundings.



ArtFX prides itself on every student securing a job following completion of their course

ANOMALIA

WEBSITE: www.anomalia.eu **COURSES OFFERED (IN-HOUSE):** Develop Content (story) – 10 days, Develop Concept Art – 10 days, Animate a Short Film II – 10 days, 3D Animation Basics – five days, Animate for Games – 10 days, Animate Short Film – 10 days, **COMING IN 2017...** Animate for VR – two weeks, Expert Rigging Lab – two weeks **STUDENTS:** Maximum 15 per course

Animation production establishment Anomalia puts the fun into 3D character animation, filmmaking and storytelling. With short, specialised courses in each discipline, including ones that run through the summer, studying at Anomalia will feel more like a vacation.

With a series of short, intensive courses, Anomalia invites the best professionals from the world's top studios – including Pixar, Disney Animation and Blue Sky – to train young artists and animation students in the modern craft of 3D animation.

Based in Litomysl, Czech Republic, you can also take in the beautiful surroundings as you study, all the while being trained by the best in the business. "I honestly feel like Anomalia was the best educational experience I have ever had, and one of the most inspiring two weeks of my career," says animation director at Dreamworks, Jason Schleifer.

ARTFX

WEBSITE: www.en.artfx.fr **COURSES OFFERED (ALL IN-HOUSE):** CGI, 3D Animation, VFX, Compositing, Game Design, Game Art (all end with a technical certificate that is the equivalent of a BTS-level III) **STUDENTS:** 360 **PLACEMENT RATE:** 100%

Located in Montpellier, France, CG school of higher education ArtFX was founded by professionals of the film, CG, video game and visual effects industries. Boasting a 100 per cent placement rate, you'll certainly be in good hands studying your chosen profession at ArtFX. Specialised courses in CGI, VFX, 3D animation and video games run between three and five years, teaching the most up-to-date techniques.

Elena Tchikakoff, a fourth year student who's specialising in rigging, explains: "ArtFX has a huge network, and also a very good reputation in VFX studios, which then makes it much easier to find a job in the industry. The school gives you everything you need to succeed, from high-level classes to amazing workshops."

5 BEST EVENTS TO MAKE CONTACTS

SIGGRAPH (US & ASIA)

www.siggraph.org

This renowned annual conference on computer graphics is the big one anyone to do with VFX and CGI heads to.

FMX

www.fmx.de

All aspects of animation, effects, games and transmedia is discussed by the world's best artists over four days at Europe's leading conference for digital entertainment.

INDUSTRY WORKSHOPS

www.industryworkshops.co.uk

Not only does Industry Workshops offer practical, application-oriented workshops, it also gathers some of the biggest names in the industry.

TROJAN HORSE

www.trojan-unicorn.com

Sip an ice-cold beer with some of the world's best artists in the sunny paradise of Portugal at THU.

GAME DEVELOPERS CONFERENCE (GDC)

www.gdconf.com

It's the largest annual gathering of professional video game developers, so you're sure to meet influential people here.



3DSENSE MEDIA SCHOOL

WEBSITE: www.3dsense.net

Voted Asia's leading digital arts school, 3dsense Media School is committed to providing the best creative education

A pioneering digital arts school in Singapore, 3dsense Media School has been preparing students for careers in the media and entertainment industry for over 13 years. Dedicated to providing a real-world education, 3dsense aims to mould the next generation of elite digital artists and designers for the global industry.

Committed to delivering the best learning experience, the school adopts a hands-on, industry-immersive teaching approach to small classes and employs full-time, expert lecturers, such as 3D animation and visual effects programme director Craig Stevenson. With over 18 years in the industry, Craig has worked at – and on – various major studios



3dsense Media School is praised for its expert lecturers and visiting industry professionals by students

and Hollywood titles, including Weta Digital, ILM and Framestore, Lord of the Rings and Superman – to name just a few.

"What attracted me to 3dsense Media School was its great philosophy, attitude and commitment to creating the best education for its students," Craig explains. "The school has strong connections with the industry and are focused heavily on training students that can leave the school with the confidence to attain a position in the industry, whether it's film or game, or TV post-production work. 3dsense also invests heavily in the same software and tools used in the industry today. Having taught at quite a few schools over the years, I've never seen such commitment to pushing the students to achieve great work."

Someone benefitting from the school's commitment to its students is Anson Ng. Studying 3D animation and visual effects, he is just days away from graduating. "The study culture here is very strong in a way that motivates students to create the highest quality artworks," Anson says. "Everyone here is passionate, there are no barriers between students and lecturers and everybody communicates to raise questions and share knowledge whenever possible. During my studies, 3dsense has constantly invited professional artists from the industry to give talks and offer insights into their working culture, and by doing so, this helped us students to get one step closer to our dream job."

3DSENSE MEDIA SCHOOL STUDENT PROJECTS



ANSON NG

3D animation and visual effects student Anson Ng is just days away from completing the 12-month course. "I really like the short and sweet one-year course of studies at 3dsense Media School," Anson enthuses.



MICHAEL RAFANEN

Visual effects student Michael Rafanen is about to start his third term, marking the final four months of his training. "The short course duration is intense but helps students learn to be time-efficient," he says. "Monthly reviews help keep the quality of work up and encourage interaction with students from other intakes. 3dsense also implement changes swiftly so software and tools stay relevant."

ESSENTIAL INFORMATION

COURSES OFFERED (FULL-TIME, IN-HOUSE, INTENSIVE DIPLOMA COURSES)

- 3D Animation and Visual Effects (12 months)
- Concept Design and Illustration (12 months)
- Motion Graphics (12 months)

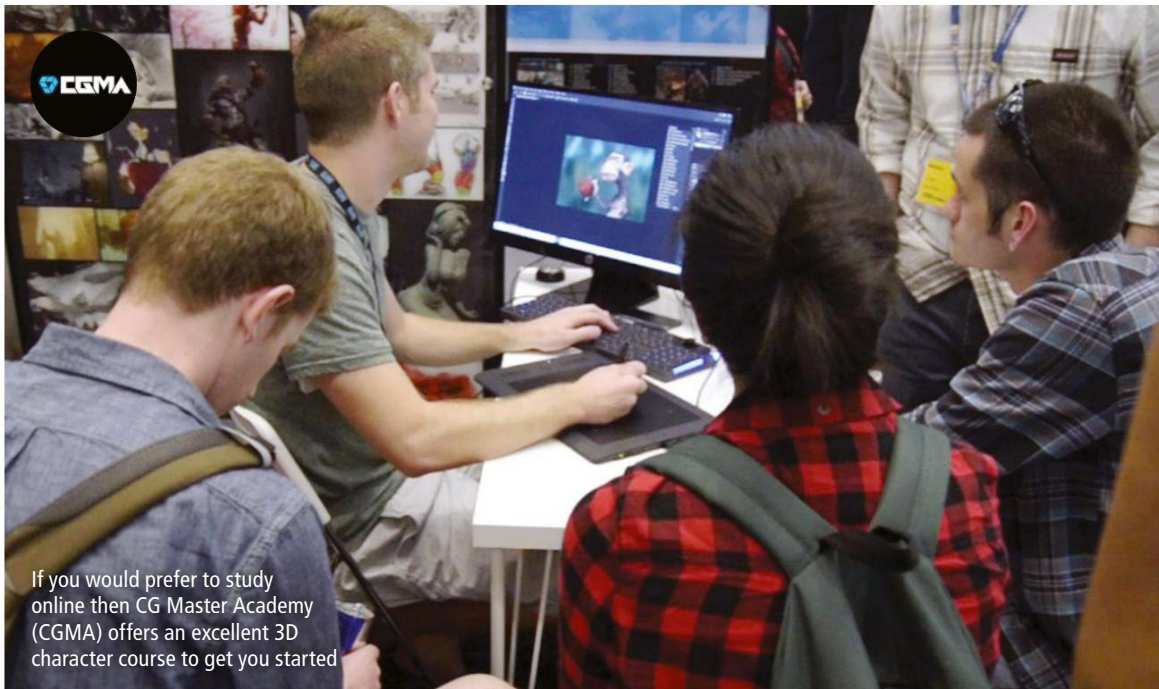
These courses are accredited by the Singapore government's Creative Industries Workforce Skills Qualification (CI WSQ) system

STUDENTS

150 total

PLACEMENT RATE

87.5%



If you would prefer to study online then CG Master Academy (CGMA) offers an excellent 3D character course to get you started

GET SOCIAL

TWITTER.COM

It's a great way to meet artists and start building contacts.

LINKEDIN.COM

Good but don't be passive, start a blog and connect with people.

POLYCOUNT.COM

The game site also includes an artist-dedicated Wiki.

MOGRAPH.NET

Join the best motion graphics artists on the planet.

FACEBOOK.COM

Good for self-promotion, and we're here to help too: www.facebook.com/3dworldmagazine

Previous ArtFX students also make regular visits to the facility to help current attendees. "ArtFX alumni, working in major studios around the world, regularly come back to meet the new students, give lectures or teach workshops," says ArtFX tutor Anders Lazaret. "This alumni network of support helps give current students one foot in the industry's proverbial door."

BELLECOUR SCHOOL OF ART

WEBSITE: www.bellecour.fr **COURSES OFFERED (IN-HOUSE):** Bachelor 3D Animation Art, Bachelor Concept Art, Bachelor Game Design, Masters 3D Animation, Masters Visual Effects, Masters Rendering, Masters 3D Art, Masters Concept Art, Masters Game Design, Masters 3D Design & Transmedia

Bellecour School of Art offers comprehensive training in the art of video game production, 3D animation and digital techniques. An incubator of talent, Bellecour provides all the necessary training you'll need to enter these competitive creative industries.

You can choose from courses lasting between two and five years, all of which are taught in a way that encourages creativity and immerses you in a professional, studio-style environment. It's clearly working; the short films made by the 3D division of the school have won awards at various festivals since 1937.

CG MASTER ACADEMY (CGMA)

WEBSITE: www.cgmasteracademy.com **COURSES OFFERED (ONLINE ONLY):** 3D Character Arts **STUDENTS:** 500 (average) per term

If online is your preferred method of study, CGMA is a great place to start. A leading provider of online digital art education, CGMA will start you on the right track to becoming a 3D industry professional.

The 3D Character Arts programme guides students through the process of what it takes to be a well rounded character artist. You'll get to grips with the importance of being effective with your tools, fluent in human anatomy, understand what makes a compelling character, and discover how to finalise and polish work to industry standards. At the end of the course, you'll apply everything you've learnt to producing your own demo reel to help land that first (or next) job.

Currently on the last block of the programme, is student Gabriel Chiang. "Specific content, affordability

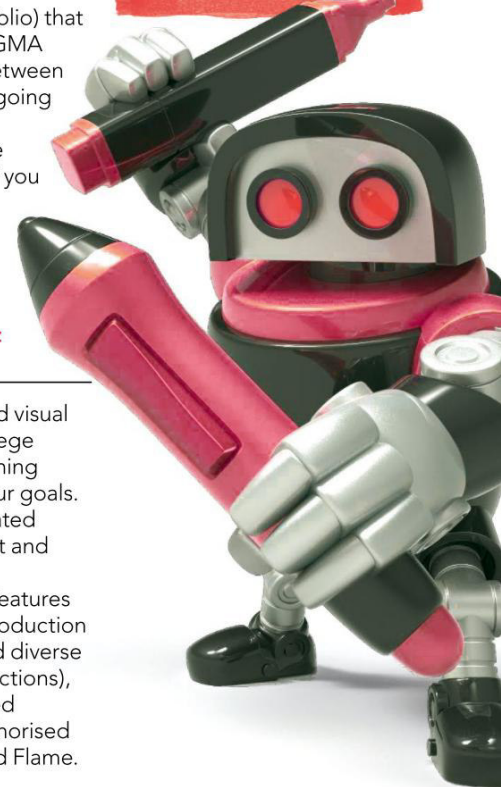
and quality of instructors (proven by their portfolio) that are currently working in industry is what sets CGMA apart," he says. "There's a great relationship between the instructors and students, with some tutors going even further and helping you outside of class. CGMA is great if you think you need to improve or refine some skills – it's a really good choice if you want to continue your education."

CG MANTRA

WEBSITE: www.cgmantra.in **COURSES OFFERED (IN-HOUSE):** Animation and VFX (36 months)

If you're on a quest for a career in animation and visual effects, new age media and entertainment college CG Mantra offers a holistic knowledge and training environment to help aspiring artists achieve your goals. An ultra-modern facility, CG Mantra has integrated facilities for advanced VFX, animation, game art and many other professional creative courses.

The college boasts impressive facilities and features for potential students, including an in-house production facility, project-based learning, a renowned and diverse advisory panel (ensuring strong industry connections), and an industry approved and globally accepted curriculum. CG Mantra is also an Autodesk Authorised Training and Certification Centre for Smoke and Flame.



Bellecour School of Art consistently wins awards for the short films made by their 3D division of the school



Escape Studios' 4,000 alumni (dubbed Escapees) enjoy careers at leading studios working on films such as *The Martian*, *Star Wars: The Force Awakens* and the latest Bond film, *Spectre*

ESCAPE STUDIOS

WEBSITE: www.escapestudios.com

Located in the heart of London, Escape Studios offers students creative courses designed, developed and delivered alongside industry leaders

Escape Studios, part of Pearson College London, is one of Europe's leading digital art academies. With over 13 years' experience creating world-class, studio-ready talent they have graduated thousands of students worldwide, helping them into careers spanning the entire creative spectrum. "Having worked closely with the major players in VFX, games and animation, we have a wealth of advice to offer you on how to get that sought after position in a top studio," explains Dr Ian Palmer, deputy vice principal of Escape Studios.

The undergraduate, postgraduate and short courses, which span the visual effects, games art and animation disciplines, are supported and curated by industry bodies. "We aim to take students with raw talent and big aspirations and shape them into the creative professionals demanded and needed by today's employers," says Dr Palmer.

Career focused

Completing an Escape Studios short course or degree in VFX, games or animation is the first step to getting hired. "We can make sure you're equipped with the right skills and materials to kick-start your career," enthuses Dr Palmer.

Students are taught by industry experienced tutors, and courses are designed to get you job-ready. Students receive continued support via a network of mentors, professionals and employers, who provide feedback on work to help you develop an outstanding portfolio.

IT ALL STARTS WITH
A TASTER DAY

Escapees *[i-ake-pee] noun*

One who believes beauty is eye-tracing,
happiness is multi-core and nothing is ugly
- it's just low poly.

Origin
April 2002 From the Dictionary Unleashed Dictionary

A number of one-day, classroom-based Taster Days are offered at Escape Studios, London, in VFX, Games and Animation, so you can get a real feel for what it's like to study here and 'try before you buy'. To find out more visit www.pearsoncollegelondon.ac.uk/sctaster. They have an excellent track record of breaking new artists into the industry, through both skill and reputation.

ESSENTIAL INFORMATION

SHORT COURSES

- 3D for VFX
- Compositing for VFX
- Motion Graphics
- Animation
- Video Games Art Production

UNDERGRADUATE AND MASTERS COURSES

- The Art of Visual Effects
- The Art of Video Games
- The Art of Computer Animation

LEARN NEW SKILLS

Get on your way to becoming a VFX master with one of our new short courses:

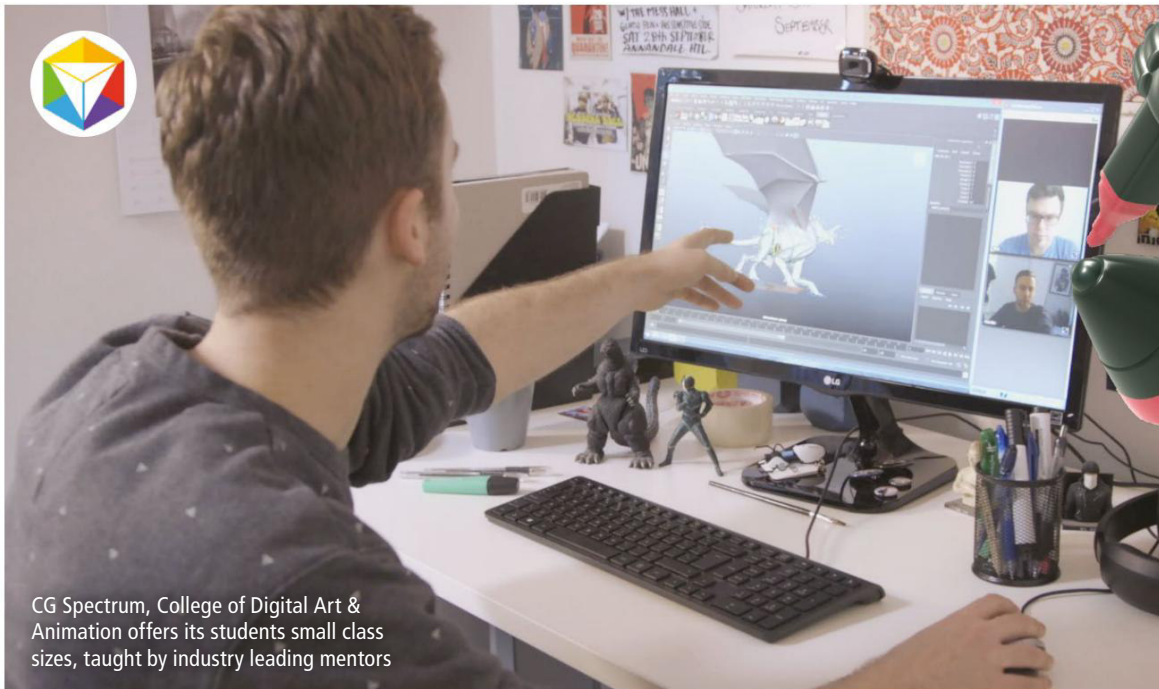
Camera Tracking Get an understanding of camera tracking and match moving key principles.

Houdini We demystify the software and teach you how to get the best out of the engine.

Storyboarding Learn the art and craft of telling a story like a pro, using the latest software.

360 VR: From Shoot to Headset Learn how to shoot and stitch 360 video for the new range of VR headsets.





CG Spectrum, College of Digital Art & Animation offers its students small class sizes, taught by industry leading mentors

CG SPECTRUM

WEBSITE: www.cgspectrum.com **COURSES OFFERED (ALL ONLINE):** Diploma of VFX Compositing (Nuke), Diploma of Advanced Animation, Houdini VFX Diploma, Maya VFX Diploma, Diploma of Concept Design, Game Art and Animation Diploma. **STUDENTS:** 30 (Canada), 100 (Australia) **PLACEMENT RATE:** 90%

Opened just five years ago in 2011, Vancouver-based online school for visual effects, animation, modelling and concept design CG Spectrum has already built up an impressive reputation for being a leading creative design training facility.

"I was looking for a school with small class sizes or something that offered one-on-one time with an instructor and CG Spectrum offered exactly that," says student Lawrence Zalasky. "I've learnt a lot from watching a pro work on my shots and I still use those workflow techniques and ideas today."

At CG Spectrum you're taught by professionals working in the industry. Director of animation at the facility Mark Pullyblank has worked as a VFX artist since 2003, including at Weta Digital and Sony Imageworks.

"It's daunting and frustrating and I think what we do best is help young artists navigate these initial rough waters," he says. "We're extremely dedicated to our students not only in improving their craft, but because we're all professional artists ourselves, we help in giving them an understanding on the overall process."

DAVE SCHOOL – THE DIGITAL ANIMATION & VISUAL EFFECTS SCHOOL

WEBSITE: www.daveschool.com **COURSES OFFERED (IN-HOUSE):** Visual Effects Production, Games Production **PLACEMENT RATE:** 75% plus

Offering comprehensive training in 3D modelling, animation, visual effects and game production, Dave School is unique in that it's located inside a working movie studio – currently occupying all of Universal's Sound Stage 25. The school regularly opens its doors to major studios and professional artists, giving students even more opportunities.

The school also boasts an impressive alumni community. In 2013, the Academy nominated five films to compete for the best visual effects Oscar award – and all five films had Dave School alumni in the credits. "In my experience as an animator, producer,

and recruiter, I have a unique appreciation for what it takes to succeed in this field," says school co-founder Jeff Scheetz. "Working with industry colleagues from several LA based effects houses, I created lessons and exercises based on actual work assignments, designed to give you a powerful command of the current tools used in effects production. In addition, the programme will strengthen your aesthetic senses and artistic development."

FILMAKADEMIE: THE INSTITUTE OF ANIMATION, VISUAL EFFECTS AND DIGITAL POSTPRODUCTION

WEBSITE: www.filmakademie.de **COURSES OFFERED (ALL IN-HOUSE):** Animation/Effects Directing, Character Animation, Concept Artist, Effects Artist, Animation/Effects Producing, Technical Directing, Transmedia/Games Artist, Transmedia/Games Directing, Transmedia/Games Producing **STUDENTS:** 128

Founded in 2002 as part of the Filmakademie Baden-Württemberg, The Institute of Animation, Visual Effects and Digital Postproduction is one of the most renowned institutions for animation and VFX.

The institute follows a practice-orientated approach. Director of the Institute of Animation Professor Andreas Hykade explains: "Our way of teaching is basically about asking questions of relevance and creating a space for the students to come up with original answers. We also don't want to teach a certain style of animation, but show as much diversity as possible. We think that artists with different point of views working side by side can benefit from each others mindset and create something new together."

Third year animation and visual effects student Dominik Stockhausen says: "Filmakademie brings together students of almost the entire spectrum of movie making."

FULL SAIL

WEBSITE: www.fullsail.edu **COURSES OFFERED (BOTH ONLINE AND ON CAMPUS):** BSc Computer Animation **STUDENTS:** 601 (online) 421 (on-campus)

Based in sunny Florida, Full Sail University graduates have been making their mark across the creative industries for over 35 years. Full Sail's approach is

5 FAMOUS ALUMNI

GNOMON

Gnomon – School of Visual Effects, Games and Animation, has an incredibly impressive list of alumni, including former student Josh Herman now lead character artist at Marvel Studios.

ARTFX

Former ArtFX student Gérald Blaise is currently working as a concept artist and modeller at Industrial Light and Magic in San Francisco, CA. He was part of the Oscar award-winning team on Interstellar.

FILMAKADEMIE

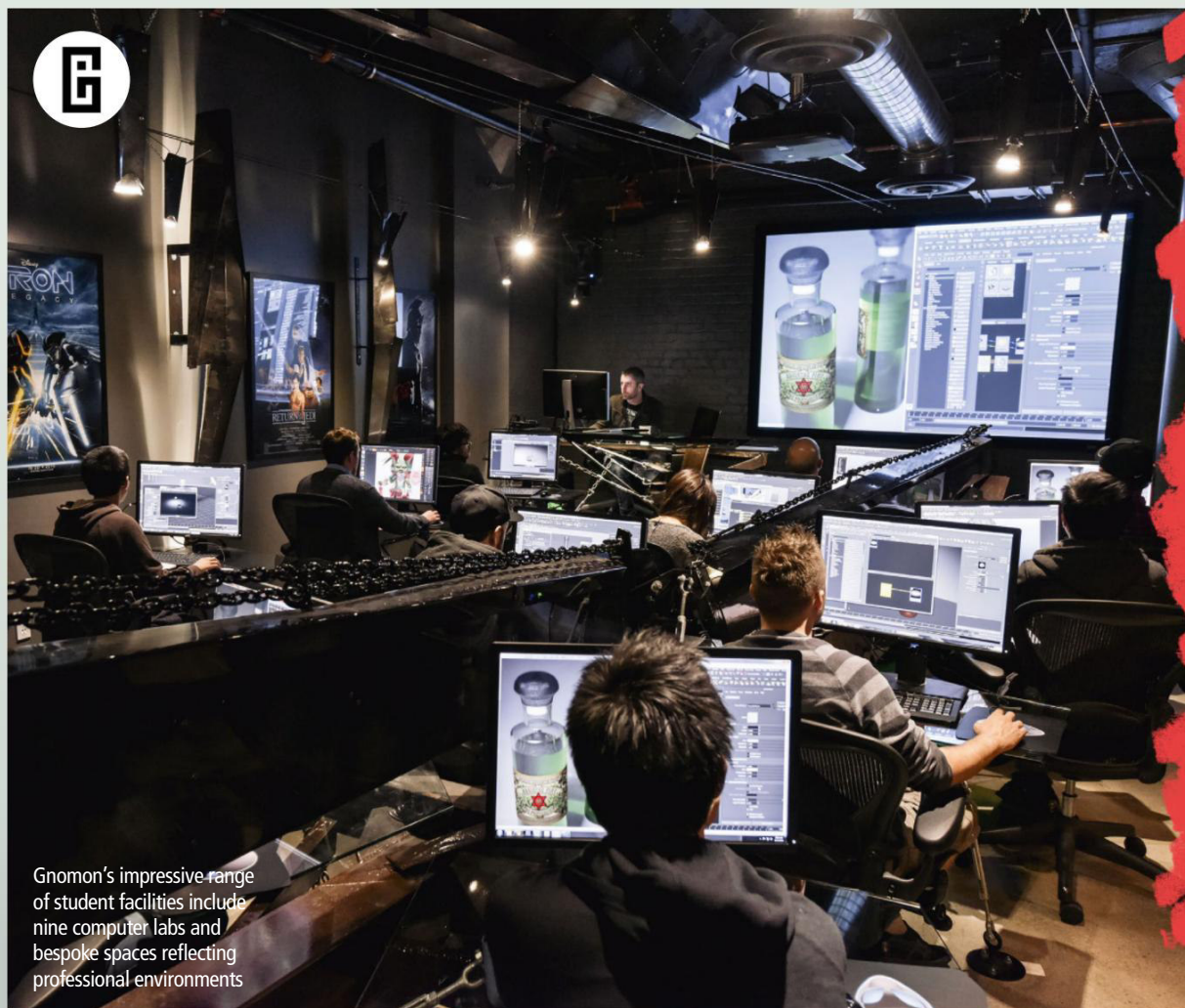
Tanja Krampfert graduated from Filmakademie in 2006 with her diploma in Animation. She's now working as character TD for Pixar and has recently earned a VES Award and an Oscar for Inside Out.

CGMA

Formerly a student at CGMA, Naveen Selvanathan went on to become a visual development artist at Sony Pictures Animation.

RINGLING

Ringling College of Art and Design graduate Patrick Osborne won the 2015 Academy Award for Best Animated Short Film for his work, Feast. He joined Walt Disney Animation Studios in 2008 as an animator on films such as Wreck-It Ralph and Tangled.



Gnomon's impressive range of student facilities include nine computer labs and bespoke spaces reflecting professional environments

GNOMON

WEBSITE: www.gnomon.edu

Located in the Television Center in Hollywood, Gnomon is at the heart of the digital entertainment industry in Los Angeles

Gnomon – School of Visual Effects, Games and Animation offers an unrivalled education experience for aspiring artists. With both two- and three-year full-time specialised programmes, and over 100 individual courses for professional development, Gnomon's curriculum places a huge emphasis on the creative process, backed up by an innovative approach to technology.

Educating the best in the business, Gnomon has been arming artists with the skills they need for a successful career in the visual effects, games and animation industries for over 15 years. And it shows no signs of slowing down.

Continuing on its distinguished path, Gnomon took home not one, but two prestigious awards last year: the 2015 School of Excellence, a high honour bestowed upon ACCSC-accredited institutions recognised for delivering and maintaining high levels of achievement among their students, and also School of the Year at the CG Student Awards (now The Rookies).

Best in the business

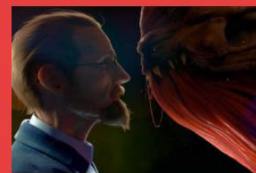
"Gnomon has some of the best teachers in the industry, who have diverse backgrounds and are working industry professionals," says Gnomon instructor Stephen McClure. "Staff are dedicated to making our students the best and placing them in the top industry positions. On top of that, the school is located in Hollywood, CA, which is one of the major hubs for entertainment design and digital production for entertainment."

With first-class teachers, classrooms that mimic professional production studio environments, state-of-the-art computer labs, a green screen stage, two cycloramas, dedicated sculpture labs, a drawing studio, lecture spaces, student lounges, a student store and the Gnomon Gallery, it's not hard to see how Gnomon is educating some of the world's best artists. Boasting an incredibly impressive list of alumni, former Gnomon students include lead character artist at Marvel Studios Josh Herman and Miguel Ortega, visual effects supervisor on The Ningyo and VFX artist on other hit titles including Thor and 300.

Hoping to follow in their successful creative footsteps is current Gnomon student Brett Shields, who's enrolled in Gnomon's newly formed Games Track. "If you're serious about working in the field of digital production, I truly believe Gnomon is the best option out there," he says. "The reputation you build in this school carries directly into the industry."

Gnomon also regularly stages free community events on campus, allowing students to meet their heroes and the studios they aspire to work for, as well as network with peers and meet other locals from the industry. "By choosing to come to Gnomon, you're not only choosing one of the best places in the world to learn your craft, you're also choosing to become part of a family of working professionals that are spread throughout the industry," Stephen says. Now, even more than ever, is a very exciting time to be a Gnomon student.

GNOMON'S STUDENT PROJECTS



FERDINAND VAZQUEZ

Gnomon student Ferdinand Vazquez recently completed the three-year Entertainment Design and Digital Production programme. The Monday after his last day at Gnomon, he got a contract at Digital Domain. "If you're passionate and serious about the VFX industry and you want the best instructors and all around knowledge of VFX, then I would definitely recommend Gnomon. It's intense and a lot of work but totally worth it!"



MARIA CARRIEDO

"The best thing about Gnomon is the networking experiences and learning and getting the latest insights from the amazing teachers that are currently active in the industry," says recent Gnomon graduate Maria Carriedo. "You're definitely in good hands with the tutors at Gnomon."

ESSENTIAL INFORMATION

PROGRAMMES OFFERED

- Entertainment Design & Digital Production (3-year)
- Digital Production for Entertainment (2-year)

ON-CAMPUS COURSES

- Over 100 individual courses available. Visit: www.gnomon.edu/courses

ONLINE COURSES

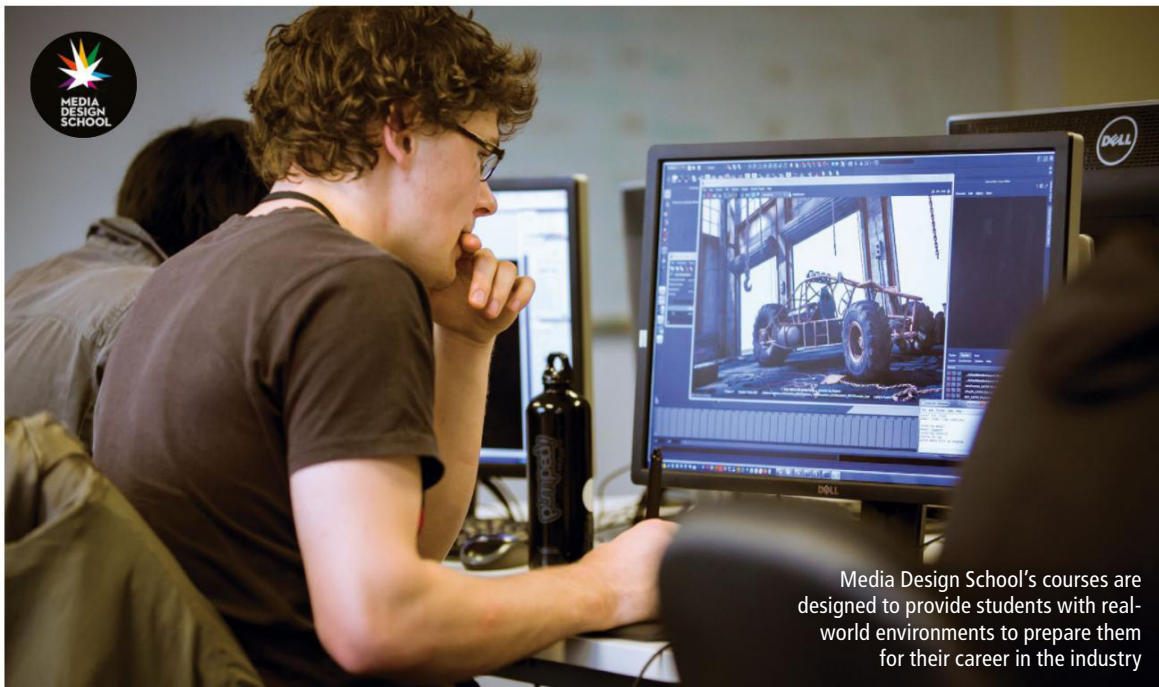
- Available to residents of California and those residing outside of the US

STUDENTS

- 224 full-time programme students
- 170 individual course takers

PLACEMENT RATE

- 94%



Media Design School's courses are designed to provide students with real-world environments to prepare them for their career in the industry

centred on real-world industry experience and creative problem solving. Their Computer Animation degree guides you through the same production pipeline used in professional studios – from storyboarding, sketching, and visual development to modelling, character animation and final compositing. Handily, you can complete the programme either online or on campus, over a period of 32 or 20 months respectively.

FX ANIMATION BARCELONA 3D & FILM SCHOOL

WEBSITE: www.fxanimation.es **COURSES OFFERED (IN-HOUSE):** Compositing Master's Programme, Specialised V-Ray Program, Professional 3D for Architecture & Interior, Design Master's Programme, 3D & Post Production for Visual Effects Master's Programme

FX Animation Barcelona 3D & Film School is one of Europe's top schools specialising in different areas of 3D, visual effects and compositing. The school adopts its very own teaching methods, based on the techniques and experiences in professional production, in order to provide their students with high levels of expertise.

FX Animation has direct links to jobs on the market in various creative sectors, including the audiovisual and video games industries, to the more technical and industrial sectors such as architecture, interior design and industrial design. The school employs professional tutors with over 20 years of industry experience.

IHMAN 3D

WEBSITE: www.ihman3dschool.com **COURSES OFFERED (ONLINE):** Multiple weekly video courses and group conferencing

If your preferred way of learning is online but you don't have access to your own software, Ihman 3D School could be just the solution to help you master the art of 3D design and animation. Committed to open source software, Ihman 3D school tutors use programs such as Blender, Gimp, Krita and Python.

There's an impressive selection of training to choose from too, a large percentage of which is free, making it a great option if you're on a budget. You'll be fully assisted along the way, as the school's education system consists of a virtual campus, which allows each individual access to training material and corrections to weekly exercises already completed.

IMAGE IRELAND VFX ACADEMY

WEBSITE: www.imageireland.ie **COURSES OFFERED (ONLINE & IN-HOUSE):** Character Modelling for Games, ZBrush Hard Surface Modelling, Creature Design, Character Rigging, Concept Art in Photoshop, Nuke Compositing, Fluid Dynamics, Lighting, Acting for Animators, Storyboarding
STUDENTS: Max of eight per course

After working in visual effects for over 20 years, in 2013, Stephen Lohan set up Image Ireland, a dedicated VFX studio based in Dublin. The country's first and only dedicated VFX school and the first Foundry-authorized Nuke training centre, Image Ireland encompasses everything from compositing, ZBrush sculpting and 3D modelling to storyboarding and photography.

Courses are intensive, and are taught by some of the best artists in the world, who have worked on titles including Dawn of the Planet of the Apes, Terminator and Star Wars: The Phantom Menace.

Image Ireland also offers an incubation hub, in which you'll get the opportunity to work with experienced tutors to develop original content.

MEDIA DESIGN SCHOOL

WEBSITE: www.mediadesignschool.com **COURSES OFFERED (IN-HOUSE):** BAD 3D Animation & Visual Effects, BCT Game Art, BMD Motion Design, Diploma in Digital Creativity, Weekend Workshop Game Programming in Unity with C#, Short Course: Sculpture Masterclass

Specialising in 3D animation, visual effects and game art, New Zealand's Media Design School will give you all the skills you need to break into the industry.

Founded in 1998, Media Design School was the first tertiary institution in the Southern Hemisphere to offer a dedicated programme of study for 3D animation using industry-standard computer graphics software, and the first school in New Zealand to provide a specialised gaming course.

Media Design School's teaching style has been created to simulate the real-world industry as closely as possible, using studio-like environments equipped with state-of-the-art, industry aligned software and technology to best prepare you for work. Ranked among the top three schools in the world providing VFX/animation and game art qualifications by the Autodesk sponsored CG Student Awards in 2015, the Media Design School team are certainly at the top of their game.

ALTERNATIVE ONLINE TRAINING

UARTSY: THE ONLINE ART SCHOOL

WEBSITE: www.uarteasy.com

A subscription-based site offering video courses in everything from 3D production design to 3D printing, game design and illustration. This site stands out for the quality of its instructors – all are professionals working in Hollywood.

CMIVFX

WEBSITE: www.cmivfx.com

This training site has nearly 40,000 members signing up to learn from online video courses that focus on VFX production for feature films. The site has weekly training courses from professionals in the film industry.

LYNDA

WEBSITE: www.lynda.com

Get access to hundreds of professional visual effects, 3D and animation-based tutorials at online education company Lynda.

EAT 3D

WEBSITE: www.eat3d.com

Specialising in video training for game development, EAT 3D was one of the first sites to offer training for Unreal and has continued to be a go-to place for game development training. A mix of free video and paid-for content, EAT 3D is worth exploring.

3D TRAINING

WEBSITE: www.3dtraining.com

A US-based online production and consulting company, 3D Training provides specialised courses to meet the industry's growing demand for skilled 3D talent.



5 ANIMATION FESTIVALS TO BE SEEN AT

ANIMA

www.animatv.be

The Brussels Animation Festival has just celebrated its 35th edition. With around 250 films screened and 31 countries represented, the festival gathered a varied audience consisting of children, adults, animation students and many professionals.

STUTTART FESTIVAL OF ANIMATED FILM

www.itfs.de

One of the most outstanding events for animated film worldwide, Stuttgart will once again become the centre of the animation world this spring.

ANNECY INTERNATIONAL ANIMATED FILM FESTIVAL

www.anecy.org

Founded in 1998, the Annecy film festival draws animation students, professionals and hobbyists from all around the globe.

OTTAWA INTERNATIONAL ANIMATION FESTIVAL

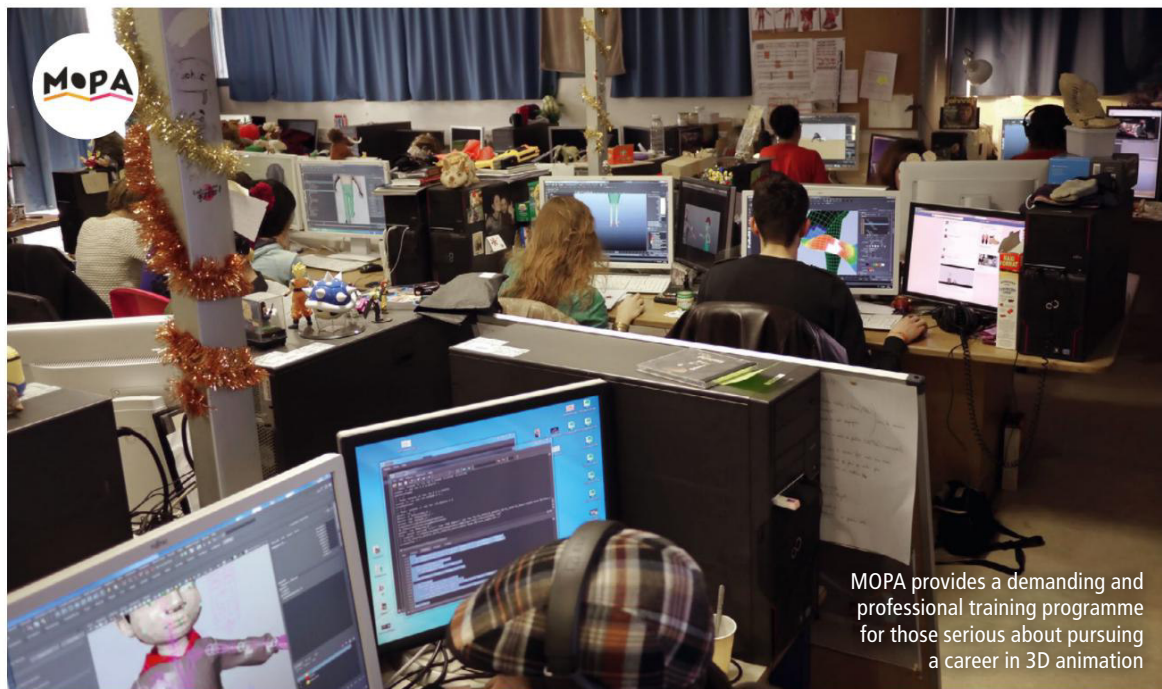
www.animationfestival.ca

North America's largest animation event, Ottawa Animation Festival celebrates its 40th anniversary this year with the world's most cutting-edge and quirky animations.

LONDON INTERNATIONAL ANIMATION FESTIVAL

www.liaf.org.uk

The London International Animation Festival showcases the whole spectrum of creative animation, showing that animation is for everyone.



MOPA provides a demanding and professional training programme for those serious about pursuing a career in 3D animation

MOPA (SUPINFOCOM)

WEBSITE: www.ecole-mopa.fr **COURSES OFFERED (IN-HOUSE):**

3D Animation **STUDENTS:** 200 **PLACEMENT RATE:** 98%

Formerly known as Supinfocom, MOPA – Motion Picture in Arles – is one of the most renowned animation schools in France. Founded in 1998, MOPA has prepared aspiring artists with the skills they need for almost three decades.

MOPA's course programme is separated into two study cycles; the preparatory cycle and higher study cycle, lasting five years in total. It's during the second part of the course that you'll choose to specialise.

"I wanted to be in the school that would give me the most credibility – the schools name vouches for you," says MOPA student Margaux Lanusse-Cazale. "At the end of this year, I'll be getting a level 1 Master's degree as 3D animation filmmaker."

MOPA's success is reflected in its award-winning student films; in 2013, the school won the Best In Show Award at the Siggraph festival with the film *À la Française*. In 2014, the film *Home Sweet Home* won the Best Animated Short at the Siggraph Festival again and was also selected at the Cannes festival. In 2015, the film *Léonardo* was selected at the Cannes Festival.

PLURALSIGHT

WEBSITE: pluralsight.com **COURSES OFFERED (ALL IN-HOUSE):** Various in all aspects of Animation, VFX and Post Production **STUDENTS:** 3 million

With a library of over 4,500 online courses, it's no wonder that more than three million digital artists use Pluralsight. You are able to access timely courses created by industry experts. Publishing 80-90 courses a month, you'll find all the training you need to help you skill-up.

User Kyle Jones is currently completing Advanced V-Ray Techniques for Film and TV with Pluralsight and is about 75 per cent of the way through. "Pluralsight allows me to learn at my own pace and on my own time," Kyle comments. "They also do a great job at selecting instructors that have been working as artists in industries like film, VFX and print. I feel like Pluralsight spends a lot of time trying to understand what a developing artist needs, and this shows in their tutorials."

RAVENSBOURNE

WEBSITE: www.ravensbourne.ac.uk **COURSES OFFERED (IN-HOUSE):**

BA (Hons) Animation, BA (Hons) Motion Graphics, MA Visual Effects, MA/MSc 3D Stereoscopic Media

Ravensbourne College of Design and Communication has a world-class reputation as a center of excellence for digital media and design. With specialised courses in animation, motion graphics, 3D and visual effects, you'll gain all the knowledge and skills you need to enter industry studying here.

At Ravensbourne you'll have access to first-class facilities, including the necessary equipment and software. Staff aren't just academics, they're still working in the industry, meaning students benefit from hands-on training from experts. The school also has renowned industry links, giving its students the opportunity to sharpen their skills in some of London's most exciting workplaces.

RINGLING COLLEGE OF ART & DESIGN

WEBSITE: www.ringling.edu **COURSES OFFERED (ALL IN-HOUSE):**

BFA Computer Animation, BFA Game Art **STUDENTS:** 279 (computer animation), 1,300 (all majors) **PLACEMENT RATE:** (estimated) 95%

Award-winning educational facility Ringling College of Art and Design has been shaping creative talent for the past 85 years. Passionate about shaping the next generation of creative leaders, Ringling's hands-on, studio model of teaching is second-to-none. This was proved in 2015 when students Mike Biddinger and Michelle Kwan beat professional studios to take the Best Computer Animated Short award at Siggraph.

Ringling offers small class sizes to allow for individual learning and emulates the atmosphere and expectations of a professional animation studio. "The school also intentionally limits enrollment into the program to keep the quality high," explains the department head for computer animation Jim McCampbell.

Current student Luiza Alaniz, says: "Ringling truly shapes you as an artist for the 21st century. The facilities and resources are great, the people are amazing, and the faculty and staff are so attentive – the work ethic and professionalism at Ringling prepares students to face the real world of art and design."





Ringling College of Art & Design boasts strong industry connections allowing students to collaborate with working professionals

SAE INSTITUTE AUSTRALIA

WEBSITE: www.sae.edu.au **COURSES OFFERED (IN-HOUSE):**

BA Animation, Diploma of Screen and Media, BA Games Development
STUDENTS: 2,500

A leading educator in creative media industries, SAE delivers expert training programmes in first-class facilities. In Australia, SAE provides courses to more than 2,500 students across six campuses in Melbourne, Perth, Adelaide, Sydney, Byron Bay and Brisbane.

SAE offers internationally recognised qualifications and industry-relevant skills. Uniquely SAE also offers a fast-track learning pathway, which means you can be industry-ready and on your way to that dream job faster – being degree qualified in two years.

Experience is core to SAE too, as you'll get the opportunity to leave the classroom and step out into the real world, with professional development opportunities at some of Australia's premier festivals and events. With a commitment to excellence in education and a hands-on, industry-focused approach delivered in state-of-the-art facilities, SAE graduates really can have the competitive edge.

THINK TANK TRAINING CENTRE

WEBSITE: www.tttc.ca **COURSES OFFERED (IN-HOUSE):** Computer Animation, Visual Effects and Game Design full-time diploma (12 months) **PLACEMENT RATE:** 92%

Based in Vancouver, Think Tank provides relevant, current and effective training to ensure you are industry-ready for the visual effects, 3D animation and game design industries.

The school runs small classes for just 12 students, with each getting a significant amount of one-on-one tutoring. You will also be assigned a dedicated workstation, which is yours for the duration of the semester and comes fully equipped with the best hardware and the latest industry software. As well as being taught by professional instructors, in the final semester you'll be assigned personal mentors from local studios (including EA Games) to meet with them each week to critique work and teach new techniques.

"Think Tank exceeded my expectations in every way," says Patrick Poage, environment artist for Cryptic Games. "It became my home away from home and I consider my time there one of the best years of my life."

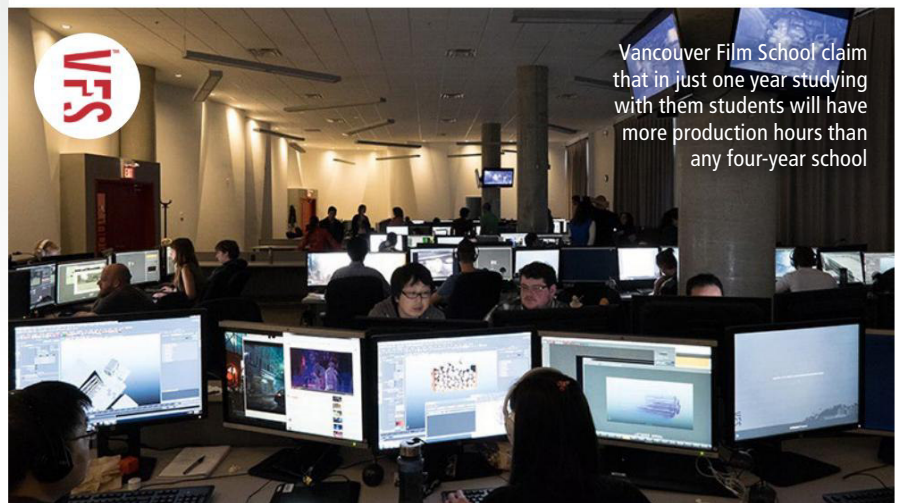
VANCOUVER FILM SCHOOL

WEBSITE: www.vfs.edu **COURSES OFFERED (IN-HOUSE):** 3D Animation & VFX, Classical Animation, Animation concept art **STUDENTS:** 3D Animation can host 36 students and has six intakes a year, Animation Concept Art can host 24 students and has three intakes a year, Classical Animation can host 28 students and has three intakes a year

Vancouver Film School has come a long way since it first opened its doors back in 1987 to a class of 12 film production students. Now home to the number one animation programme in Canada, according to the Animation Career Review, you'd be hard pushed to find a better facility in the region.

The school boasts a host of enticing reasons for new students to apply to study there, claiming that in just one year at Vancouver Film School, you will have more production hours than any four-year school. Vancouver Film School is also equipped with facilities that define industry standards, taught by veteran professionals with credits on the most well-known franchises, products and entertainment properties. With all this behind them, it's not hard to see how Vancouver Film School is producing some serious talent.

"I have worked with people from VFS at every studio I have been a part of and they all have an amazing work ethic," says Anthony Di Ninno, VFS graduate and senior previz artist on Man of Steel.



Vancouver Film School claim that in just one year studying with them students will have more production hours than any four-year school

5 BEST PORTFOLIO SITES TO USE

ARTSTATION

www.artstation.com

A leading showcase platform for games, film, media and entertainment – you're sure to get noticed here.

CG SOCIETY

www.cgsociety.org

The go-to place for CG artists, CG Society has a brilliant portfolio service, offering users the ability to connect with other artists and promote their work.

ZBRUSH CENTRAL

www.zbrushcentral.com

Join the ZBrush Central community today and start to interact with a world-wide network of like-minded artists.

VIMEO

www.vimeo.com

It may not seem like an obvious choice, but Vimeo is a great way to get your artwork online and seen by thousands of creatives around the globe.

BEHANCE

www.behance.net

Easy to use and allows you to share your art, and discover the latest work from top online portfolios by creative professionals across the industry.

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Practical tips and tutorials from pro artists to improve your CG skills



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GET YOUR RESOURCES

You're three steps away from this issue's video training and files...

1. GO TO THE WEBSITE

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2. FIND THE FILES YOU WANT

Search the list of free resources to find the video and files you want.

3. DOWNLOAD WHAT YOU NEED

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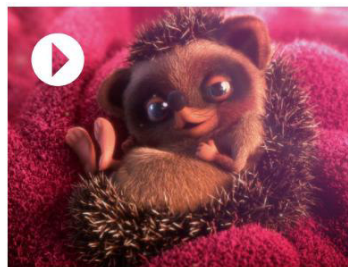
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ZBRUSH | KEYSHOT

CONCEPT DESIGN A ZBRUSH CREATURE

Ian Joyner shares his ZBrush and KeyShot process for designing a unique creature concept for film production



ARTIST PROFILE

Ian Joyner

Ian is a concept designer, illustrator and art director. His credits include Jurassic World and Godzilla. He teaches online at www.secretlabs.xyz. www.ianjoyner.com

Whenever I start a new character I try and think of the how and why of what I'm doing. For this, we wanted a striking creature bust, screaming at the camera. I wanted to approach this in a very open manner and see where the digital clay would go.

I did have a few things in mind. For some reason I wanted to do something red and somewhat shiny. I looked at ants, crustaceans and even rodents, and began to sketch out some

rough ideas in my sketchbook. I like to start things in 2D – even if they never go anywhere it opens up my brain a bit.

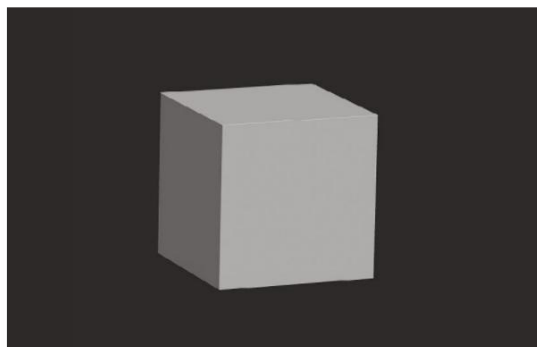
Over the course of this tutorial you will learn my basic pipeline and approach, and I hope you can pick up some tips to include in your next project.

My workflow is always evolving and changing on a per project basis, but the main things that I have found to be constant is having strong foundational skills in sculpting and painting.

My studies of life, such as sketching at the zoo, studying anatomy or creating simple sculptures, always helps when I go back to doing fantasy creatures.

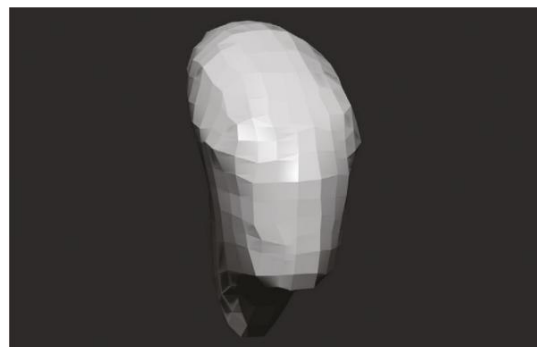
As you develop your art career you'll discover that software trends can come and go, but the core art skills remain the same; if you focus on those areas the tools and techniques can change as often as needed but the results will always be consistent!

For all the assets you need go to creativebloq.com/vault/3dw208



1 START WITH DYNAMESH

I almost always start with a sphere or box and go to DynaMesh fairly quickly. I find it is best to start at a very low DynaMesh (sometimes as low as eight or 16) and work each step until I can no longer get the result I desire. The box with a few subdivisions is great because it keeps me thinking in very simple terms. At this stage I am mostly using only the Move brush and smoothing.



2 MASTER 3D SKETCHING

I have pushed the low DynaMesh and figured out a very simple head shape. Nothing fancy here but I do try and think of the overall character at this stage. I consider sketching this in 3D, so I want to make sure the 'doodle' is evolving as I find the character, not the other way around. At this stage I am mostly only using the Move brush and Smooth but I may use Pinch and Inflate as well.

TOPICS COVERED

- Sculpting
- Concept design
- Render passes
- Presentation

TAKING INSPIRATION

When working on fantasy creatures, Ian likes to draw on his experience of studying real life



WORK MACRO TO MICRO

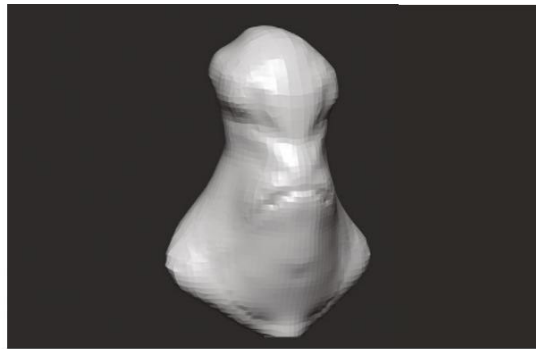
Keep refining each DynaMesh level until it no longer achieves your goal. The worst thing that can happen is to have the software fight you as you try and shape your design

KEEP EXPERIMENTING

For more creativity, look for happy accidents and organic mistakes early on in the sculpting process

EXPERT TIP***Pace your details***

A tip I think most artists could learn from is to always allow for areas of rest. If you want to have an area of focus, be sure to have larger areas of calm around it.

**3 DEVELOP THE CHARACTER**

Once I have the simple shape blocked in I will up my DynaMesh settings and begin to find the character. The beauty of designing in 3D like this is I am never stuck with my initial block-in. Early on I was thinking of a fatter and funnier kind of character. I'm still primarily sculpting with the Move and Smooth tools, but I will start to use the Standard brush or Elastic to sketch in some more distinct ideas.

**4 BREAK CREATIVE BLOCK**

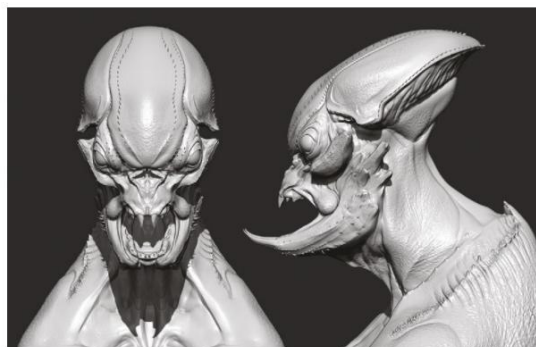
I sometimes find my initial shapes to be a bit safe, so once I get a direction, I like to use the SnakeHook brush and try to break my way of thinking. For design, 3D has a tendency to feel very stiff or lifeless, so I am always trying to fight that. I still work on the lowest Dynamesh setting I am able to and still get the form I want. Detail is not even entering my mind at this stage.

**5 FINDING SECONDARY FORMS**

The bulb head and long prongs along with the odd neck shape are starting to really balance out well for me. I am starting to find out who the character is at this stage. I am finally stepping up the DynaMesh to start figuring out secondary forms and such. At this point the character is starting to emerge. I still have a lot to do, but I will now use ZRemesher and project this detail onto a low resolution cage to continue refinement.

6 USE ZREMESH

This is where I take the DynaMesh sculpt and decide it has enough information to give it a quick ZRemesh. The settings I use change on everything depending on need, but I usually change the Target Poly Count to something like one or two; Adaptive Strength between 20-50. I rarely use the more advanced controls such as Curves or Polypaint for concept remeshes, but it is nice to have those options when or if needed.

**7 USING DYNAMESH**

Always duplicate your DynaMesh before remeshing so you can add divisions and project the detail and information back to the newly remeshed subtool. This will aid in everything, from being able to add more detail to posing. One thing I really like about this workflow is that I can now change my main forms and retain the secondary detail on the higher levels, allowing me to explore more dynamic shapes I may have otherwise ignored.

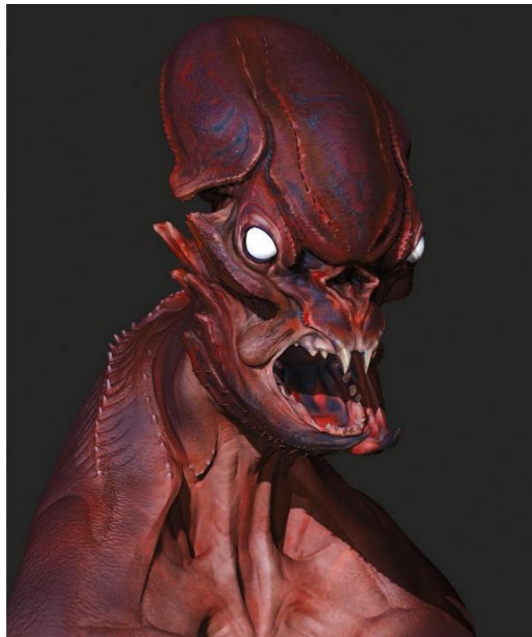
8 BEGIN ADDING DETAIL

Once I have shapes I like, I begin adding detail. Tiny barbs, wrinkles, crustacean-based shell motif. This stage usually goes fairly fast so long as my primary and secondary forms are strong. When detailing, balance high and low areas of detail – this will draw the viewer to the areas you want them to see and really guide the eye around your character. The worst thing you can do is over detail a design. Simple is almost always better. When in doubt, look to nature.



9 NOW ADD COLOUR

This stage sometimes bleeds into the detail step; as I add colour I may also add new detail as needed. This step is about reinforcing my sculptural detail – highlighting ridges and prongs and darkening areas to keep the viewer looking at the face. Designing in 3D can sometimes become a trap when you want to finish every aspect of a sculpt before presenting the image. Very rarely do you have the time to do this, so focus on what matters!



EXPERT TIP

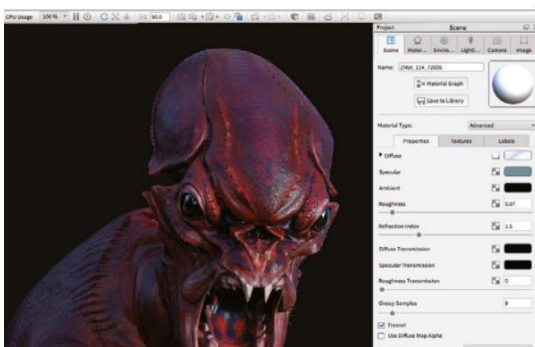
Consider your pose

This bust was designed for the cover, so I knew the body would mostly fall away to darkness, which means I just need an interesting form/silhouette and can focus my time on the face. Sometimes, something as simple as a turn of the head can really bring life to your character.



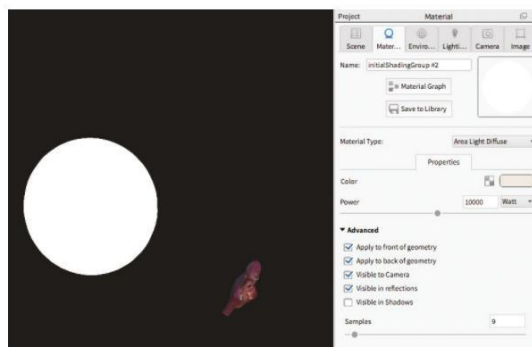
10 UNDERSTAND POSING

Posing is a very important and often overlooked aspect of doing 3D design. A lovely model in a static pose very rarely is altogether striking. This is a simple bust but I still try and think of balancing the creature, even with an imaginary body. If the head goes one way, the torso will try and balance it by going in the opposite direction. This adds drama and interest to the creature, as opposed to simple stacking everything on top.



11 SETTING UP KEYSHOT

ZBrush materials in KeyShot have no specular or roughness; they use a fake baked-in specular from the ZBrush information. So, add specular and roughness to your materials to see how the lighting works. Be subtle: too glossy can look fake or wet and overly diffuse will wash away the form. For the eyes, I use a bright white specular/gloss and no roughness. For the skin I use a subtle blue-grey and turn the roughness up so it scatters the light.



12 LIGHTING IN KEYSHOT

Lighting in KeyShot is amazing at first glance. The HDRI settings really open up a lot of quick lighting scenarios to play with. Sadly, I find they also lend towards a bit of a fake/product feel to nearly all of my renders. To counter this I like to add in area lights using simple spheres to really control my lighting set up. This can make your render times get a bit crazy, so be very careful when experimenting.



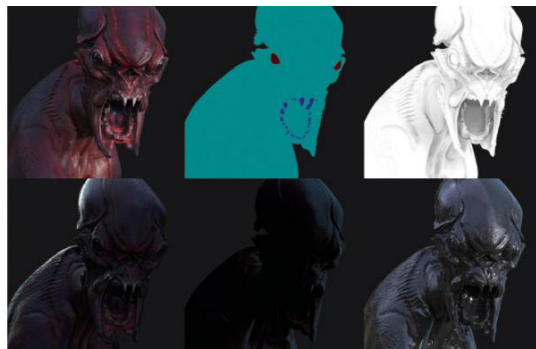
RENDERING

Using KeyShot bridge

I use the ZBrush to KeyShot bridge, even early on, to see how my sculpt feels in real-world lighting. I find this very useful as often the camera settings in ZBrush might not be best for the project and limit your ability to judge how the design is progressing. The two programs work together so well it's almost like they were made for each other. Here you can see the same model and material under different HDRI Lighting conditions.

RENDER PASS PROCESS

It may be subtle but having multiple render passes to use in Photoshop makes a world of difference to the final presentation

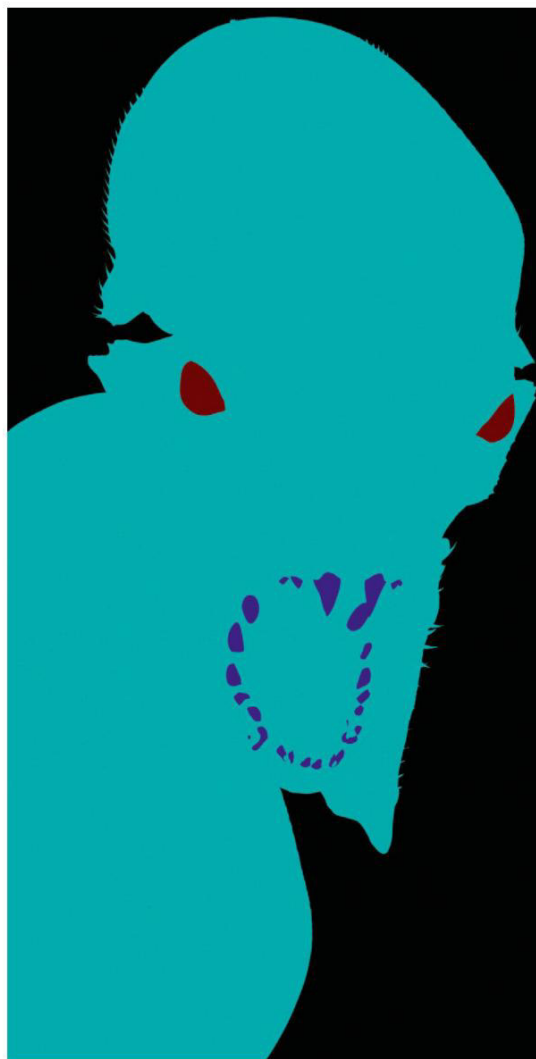
**13 USING RENDER PASSES**

Render passes are an integral step for me. Very rarely am I thrilled with the one off material. I like to render out multiple passes and take them into Photoshop for extra control. Reflective or wet areas might look great in the eyes or mouth regions but seem oddly out of place on the overall body. By rendering out a few passes, I can have complete control over the final look of my hero shot. I'll look at each pass in the following steps in more detail...

14 BEAUTY PASS

The main pass I find I always use is a Beauty pass. Basically this is the master render – it has a nice material, with texture. If all I could show was this pass it would still be presentable, just lacking the pop we get by comping together other passes.

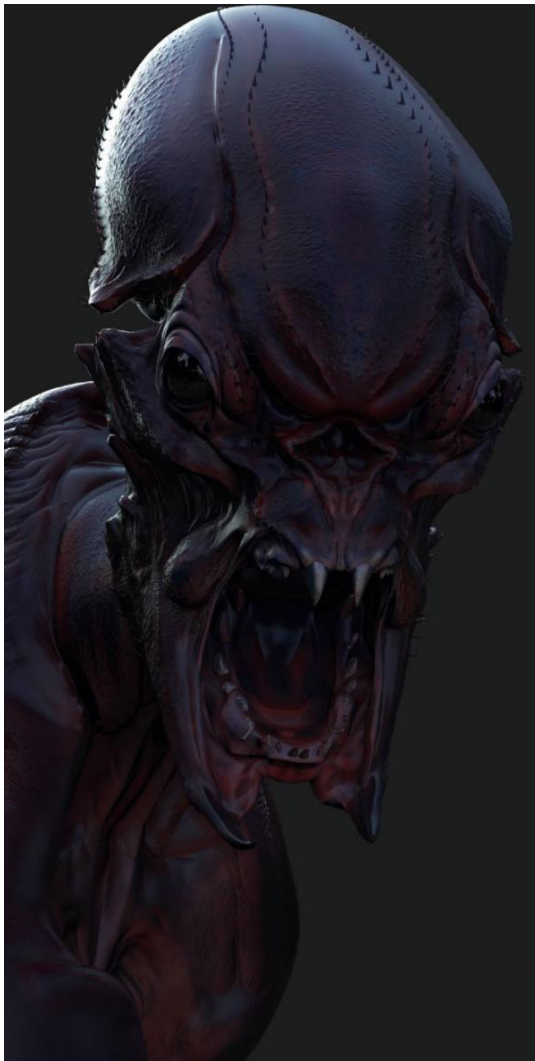
Using a Clown pass becomes a useful tool for quick selections and masking of these various areas

**15 CLOWN PASS**

A Clown pass is useful if you have many different materials. For example, my creature has a variety of materials for the eyes, bust and teeth – as well as some of the barbs and spikes lining his shell-like areas. So using a Clown pass becomes a useful tool for quick selections and masking of these various areas, speeding up my workflow and simplifying the process.

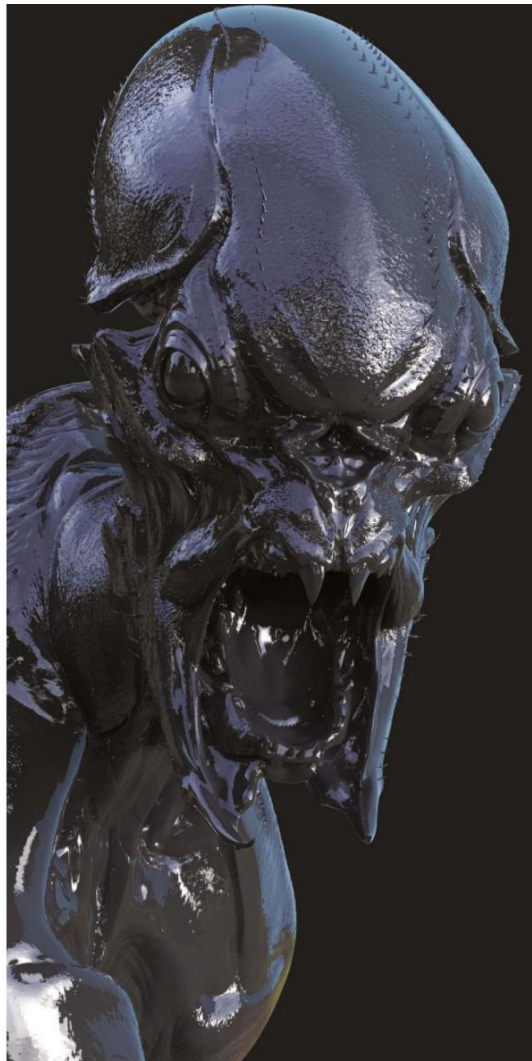
16 AO PASS

The AO pass (Ambient Occlusion) is great for defining crevices and form shifts in your ZBrush creature sculpts. I like to use this on a low Multiply Opacity setting to help shadow out some areas. Sometimes I like to mask this too, and let some areas show more than others.



17 RIM LIGHT PASS

Rim passes/Light passes are great if you want to make sure your creature sculpt is really popping off the background and the form is reading correctly. The silhouette is key to all good creature designs and this set of passes is a quick and easy way to check the sculpt is reading well. The easiest way to do this is just to turn off all other light sources but the one you want to amplify.



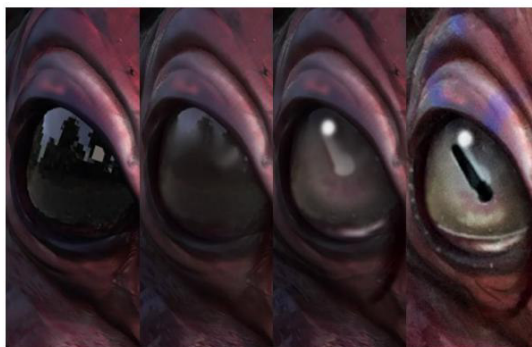
18 REFLECTION/SPECULAR PASS

Finally, a Reflection pass/Specular pass can be great for adding a bit of gloss to areas that might be looking a bit flat. It is important to mask or paint this or you run the risk of having an overly glossy or uniform shine to everything. Think about your own face, chances are your lips and eyes (and maybe nose if you have a cold) are a bit more wet than your cheeks and forehead.



19 USING PHOTOSHOP

Once I have a few passes rendered out I will jump into Photoshop and start layering them. Specular passes on screen or softlight; Ambient Occlusion passes on multiply (or maybe as a mask for other materials). Every character has different needs. Once I get a nice base going I quickly collapse my layers and begin to just paint on the design. Again, part of this is to get rid of the CG feel on the image as it can feel a bit lifeless.



20 FINAL TOUCHES

I like to spend time refining key areas of the creature at the end of the process, for example, creating the eyes. I like to paint my eyes – I very rarely sculpt and render out proper eyes anymore. They are fun to paint and very easy and fast to create. Usually I will render a white sphere or black sphere and just use this shape as a guide to figure out the next steps and have fun painting in something unique. ■



FIND YOUR STYLE

How to ensure your concept style

I think the artists I most admire in the concept world all have a distinct voice or look – and as a 3D concept artist it can be easy to lose that. This is where you can really bring in the personal touch. Some characters will be 75 per cent paint over and just a simple shape rendered out, which is great for rough or quick ideas. Others will be mostly rendered images with minimal tweaking in Photoshop. This always works best on more detailed or finished sculpts.



MAYA | MARI | V-RAY

TEXTURE A LIFELIKE BIRD FOR ILLUSTRATION

Paul H. Paulino reveals how to break down patterns and details for more realistic textures



ARTIST PROFILE

Paul H. Paulino

Paul is a texture painter and look development artist currently working in Vancouver, Canada, at Scanline VFX.
paulhpaulino.com

The Southern Cassowary was a collaborative project between myself and my friend Daniel Rodrigues (www.danielsrodrigues.com). It is the third and last piece of my student reel completed at Think Tank Training Centre.

During my time in school I was mentored by Justin Holt, who is an incredible artist that guided me through the whole texturing process. After deciding to texture the cassowary I asked my talented

friend Daniel to sculpt it for me. He was done with the model in a couple of weeks and then I began the texturing/look development process, which I'm going to explain here.

I chose the cassowary because it is such an interesting animal; it has an incredible colour palette, which was an exciting challenge from a texturing point of view. Aside from that I've always been amazed by the wonders of nature and being able to recreate something

like that was an incredible achievement for me as an artist.

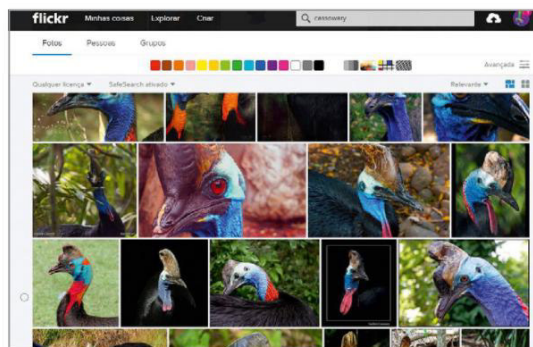
In this tutorial I will go through some of my texturing workflows and techniques for creating a realistic southern cassowary using Maya, Mari and V-Ray. By analysing real-life references and learning how to breakdown patterns and details, you'll be able to apply these concepts in your own projects.

For all the assets you need go to creativebloq.com/vault/3dw208

EXPERT TIP

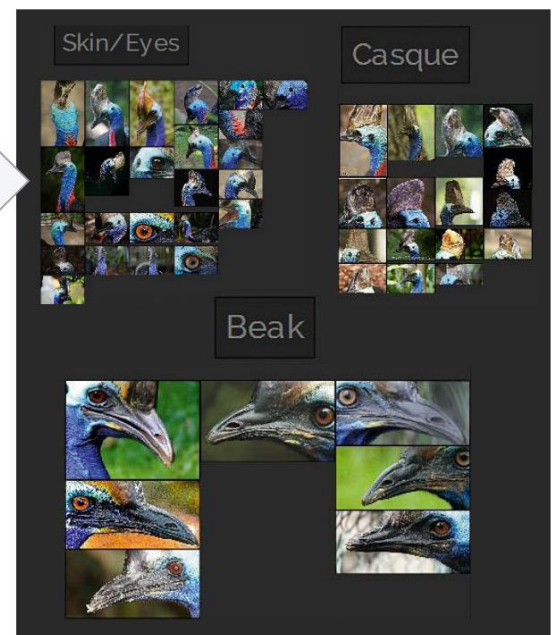
Limit your references

You're going to find a lot of variation in your references. Stick with one to three during the project and use the others to understand detail patterns.



1 GATHERING REFERENCES

To achieve a photorealistic result it is crucial to find good references. I recommend using Google images and Flickr to find high resolution images; this way you'll be able to see and breakdown all the details in your textures. After picking a good amount of references I use a software called PureRef to categorise them. I separate the references based on the casque, beak and skin. Since each bird is so unique, it is a challenge to find a middle point between the photos.



TOPICS COVERED

- Texturing
- Modelling
- Creating colour palettes
- Detailing
- Painting

TEXTURE CHALLENGE

Paul chose to texture the cassowary as it has a remarkable colour palette



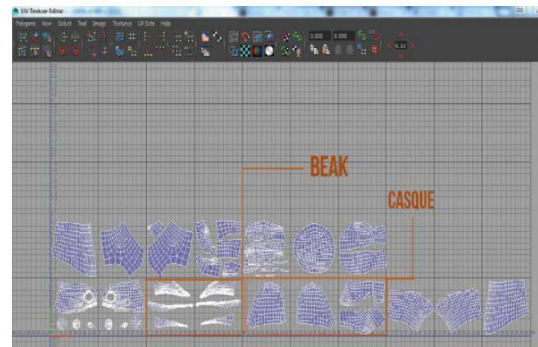
TUTORIALS

Texture a lifelike bird



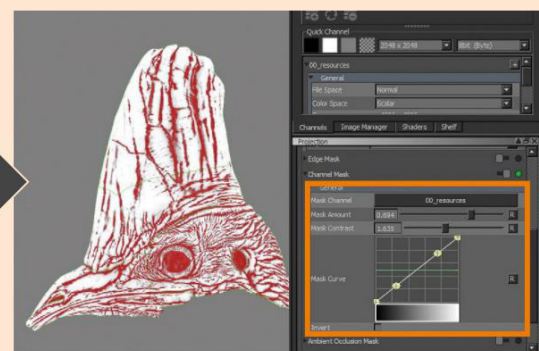
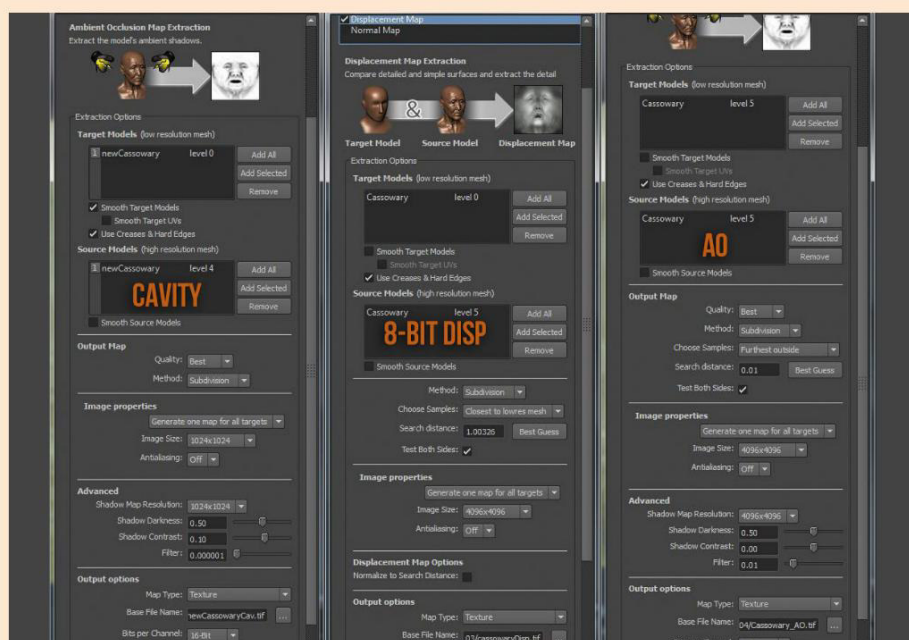
2 CREATE A GOOD MODEL

It doesn't matter if you have amazing texturing skills if your model doesn't look good, so make sure you have a realistic sculpt to work with. In my case I asked my talented friend Daniel Rodrigues to sculpt the cassowary for me. We worked together for a few weeks until we got the final model. I asked him to sculpt only the primary and secondary details since I was going to work on the high frequency details in Mari.



3 UNWRAPPING THE BIRD

For this tutorial, the UV mapping process is done in Maya. The 2015 version has new features and the integration with Unfold3D is amazing – it helps me a lot during the UV process. I separate the casque, the beak and the skin in the UVs to make selections easier. In Mari I am able to paint the UV seams, so I don't have to worry too much about having multiple UDIMs.



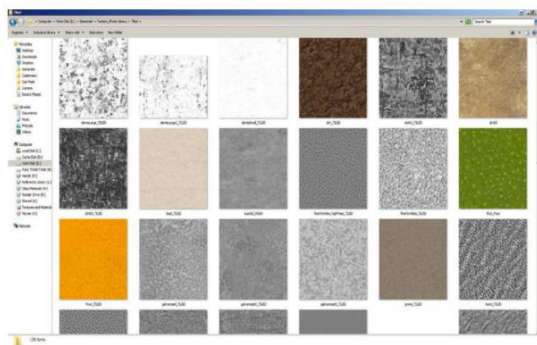
4 BAKING AUXILIARY MAPS

Before jumping into texturing I bake a few auxiliary maps (AO map, 8-bit Displacement map and Cavity map) in Mudbox. These maps help a lot since they are used as masks to drive and isolate details in specific areas. They can also be used as a channel mask in Mari if you want to project anything in your model. The channel mask will generate a real-time mask based on your auxiliary maps.

SAVE AND KEEP

Reuse your favourite textures

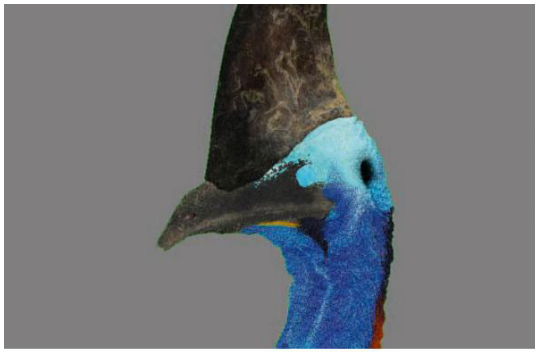
A texture library is one of the most important tools within the texture painter toolkit. After each project, make sure you collect and save all the textures that you've used. Be organised and separate everything properly – this step can save you a lot of time in the future. Also, get used to creating tiled textures from your regular textures and create a folder just for them. It's also worth separating another one for the masks that you've created.



5 CREATE A COLOUR PALETTE

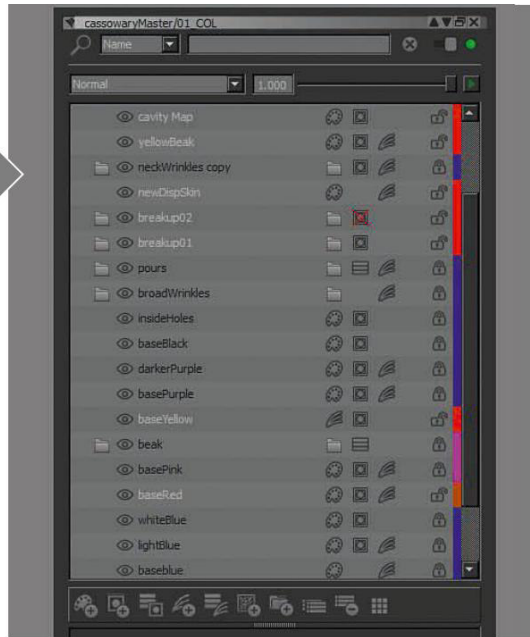
The cassowary is colourful and its blue tones are beautiful. In order to achieve all these variations of blue, ultramarine violet and orange, I create a colour palette. I do the same thing for the casque, which is not as colourful as the skin but still has some interesting colour variations that help bring the bird to life. Again, since the references have so many different colours, I have to find a good balance between the photos in order to achieve realism.





6 PAINTING THE SKIN TONES

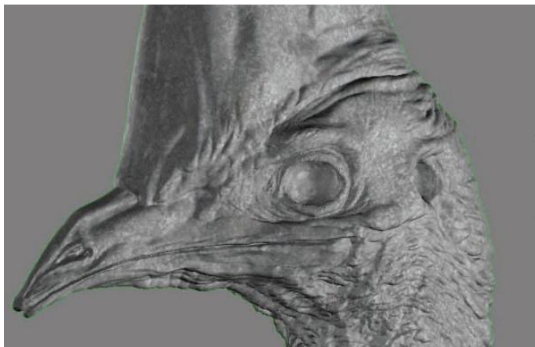
After defining the colour palette I begin painting the skin. I create several layers, each one with a different colour based on my previously created colour palette. Then I create a mask for each layer and start masking each colour separately with a Soft brush. This process enables me to get an interesting colour variation and gradation between the tones. For the black patch on the face I use a different brush to mimic a pattern that I saw in the reference photos.



EXPERT TIP

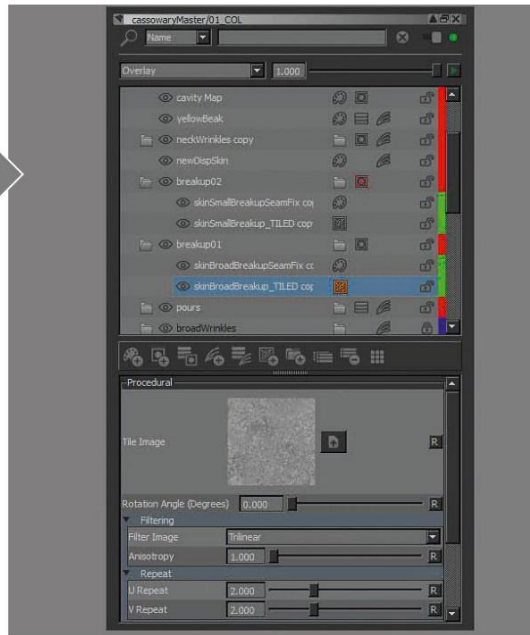
Adjusting colours

You can add an HSV adjustment to your colour layer, which will allow you to change the Hue, Saturation and Value if you need to. This step can be helpful if you need to modify your colours without repainting it.



7 COLOUR VARIATION

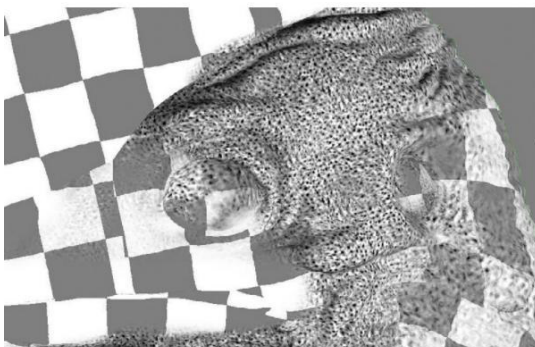
Using only basic colours will make your textures look really flat. In order to get some variation I decide to add galvanised textures on top of the layers, lowering the opacity to 20 per cent and changing their Blend mode to Overlay. This is also the time to use the previously created maps. I use the 8-bit Displacement and the Cavity map on top of the layers and change the Blending mode to Soft Light and Overlay to get even more breakups.



VISUALISING YOUR TEXTURE PATTERNS

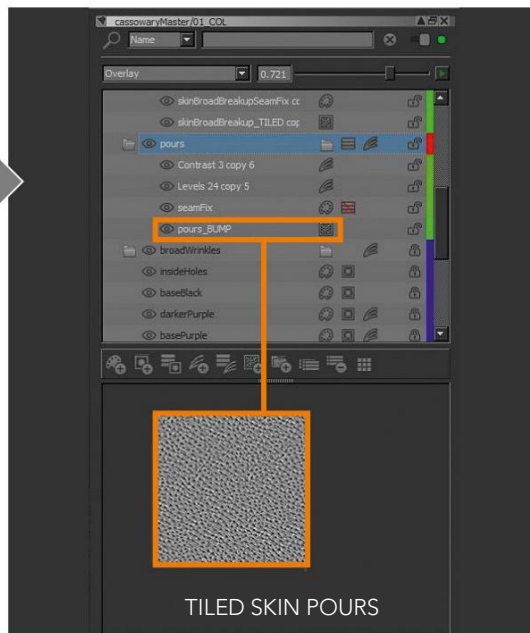
Learn to look closer at your references

Learn to visualise and understand patterns in nature to use in your own textures. A really tricky part during the cassowary texturing process was to mimic the casque pattern, since I couldn't find a good reference photo to extract the mask from. So I had to start looking into other patterns, like plaster and flaking human skin.



8 ADD HIGH FREQUENCY DETAIL

After getting the basic colours and variations it's time to add some fine details to the Diffuse map. I project human pores on the skin based on my references. Since the bird's pores have so many sizes, I have to pay attention as to where those details would be placed. After projecting the high frequency detail, I put it on top of the colour layers and change the Blending mode to Overlay.

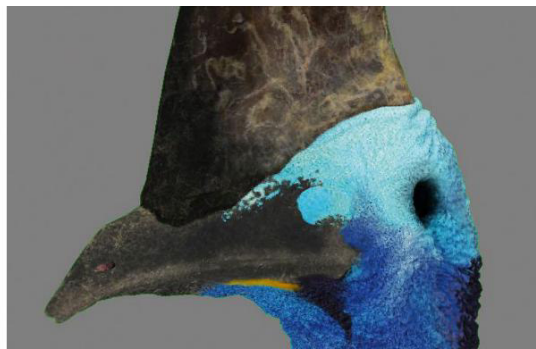


KEEP IT REALISTIC

Pores are not completely uniform in real life so add some opacity variation in your projection by erasing some parts

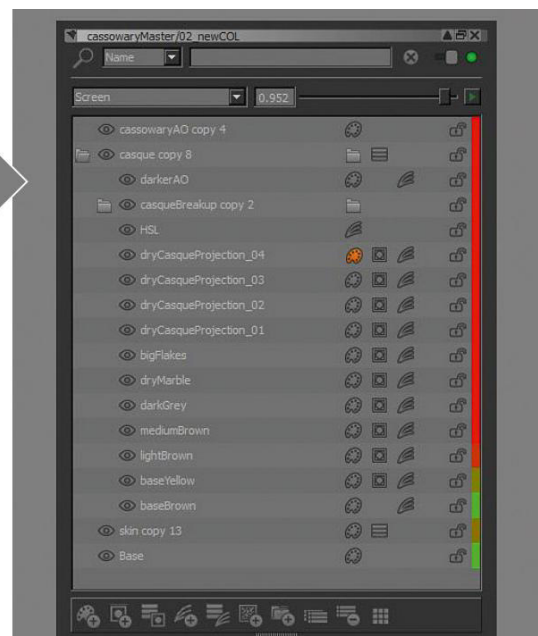
TUTORIALS

Texture a lifelike bird



9 CASQUE DETAILS

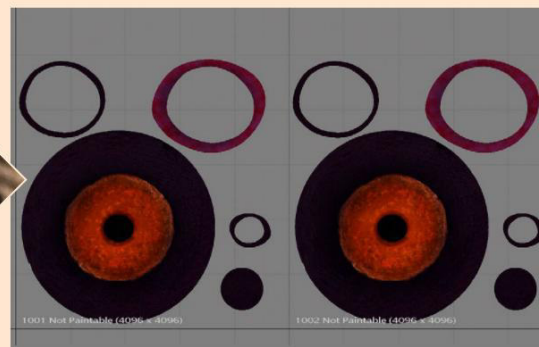
After getting all the colour variation I want for the casque, I use some masks that I create in Photoshop to add the flakes/dry skin detail. This step is really important and really helps to add realism to the piece. Looking at the references you can notice that some birds have a crazy amount of flakes and others don't. Once again I have to find harmony between the references to achieve a realistic result that would fit my piece.



BEFORE



AFTER



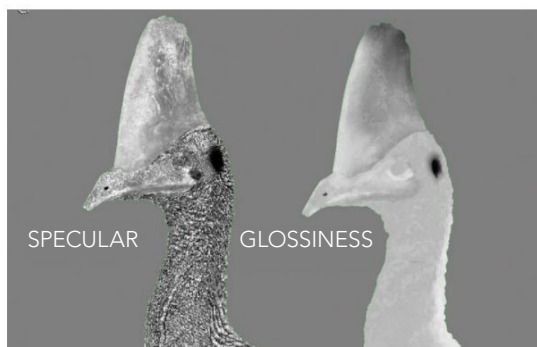
10 PAINTING THE EYE

The eye is one of the most important parts of a portrait so I have to pay a lot of attention. I try to find a high resolution photo of a cassowary that I can use for the eye, but I don't find anything usable. So I begin to search for bird photos in general and I find a great photo of an owl, which has a similar eye pattern. I take the UV masks into Photoshop and colour correct them based on the cassowary eye.

ORGANISE LAYERS

Structure your workflow

During the texturing process in Mari you can end up with a crazy amount of layers and channels. An organised scene is vital to make your life easier, so create a name convention that makes sense and use it for everything. Another tool in Mari that can help your organisation and also speed up your workflow is the Selection Groups. This way you'll be able to work without worrying about losing track of your materials and textures.

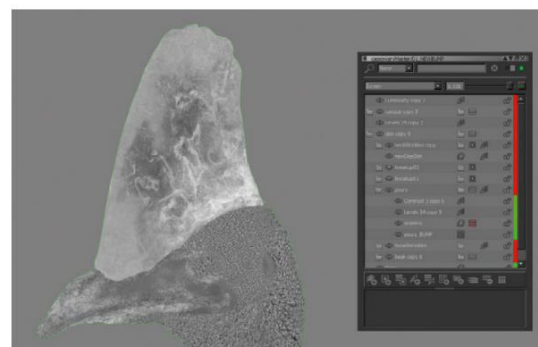


SPECULAR

GLOSSINESS

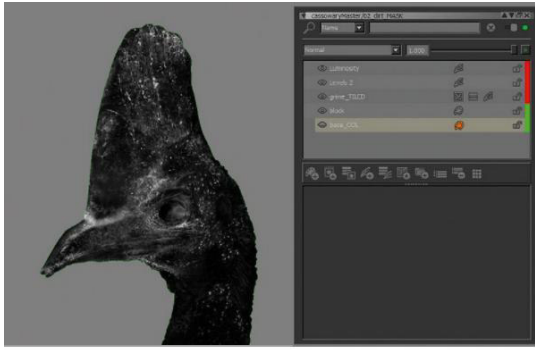
11 SPECULAR/GLOSSINESS MAP

After finishing the diffuse I start to convert it into Specular and Glossiness maps. The Specular map will need to be darker where the dirtier areas are and lighter where the cleaner, more reflective areas are. The Glossiness map is doing a similar thing except the tonal values don't determine specular intensity; they denote specular highlight falloff, or softness. For V-Ray, white areas in the map create a tight specular hit, and black areas a more scattered, diffused specular.



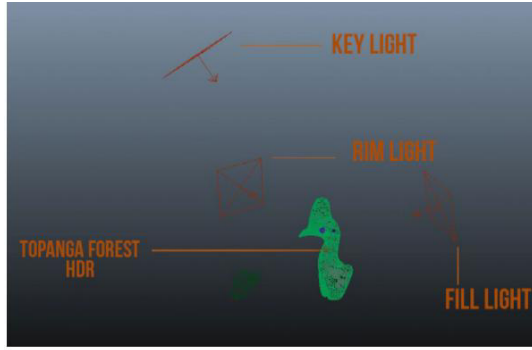
12 BUMP MAP

The Bump map shares the same source as the Diffuse map, so it will match all the relevant details. First I desaturate the colour and use Levels Adjustment to change the contrast. In this map I use the same high frequency detail (pores) that I painted on the colour. Be careful the grade doesn't crunch out detail at the far ends of the range – you don't want to lose detail in the light or dark areas.



13 ATTENTION TO DETAIL

In order to make the cassowary realistic I have to observe all the details. These birds get dirty, they scrape and scratch and pick up all sorts of damage and wear and tear. I like to apply these details on a separate layer using the Ambient Occlusion map that I have created previously, as a mask to drive the dust and dirt into occluded areas. I also have to find different textures that match the patterns that nature creates.

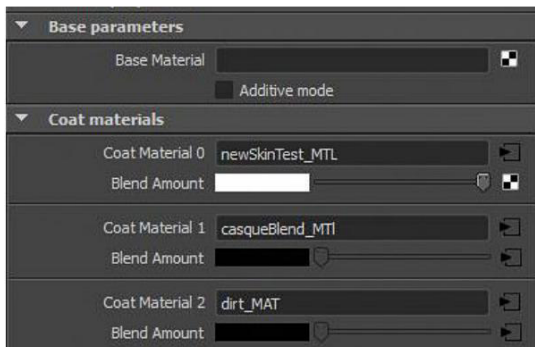


14 LIGHTING SETUP

Since I am aiming for realism I analyse the lighting from the reference photos that I gathered previously and I realise that most of the photos were taken within a rainforest, which is the natural habitat of a cassowary. So, I use a free HDR called Topanga Forest that you can download here: www.hdrlabs.com/sibl/archive.html. Aside from the HDRI, I also add extra lights to create an interesting and dramatic lighting setup, as you can see on the image with this step.

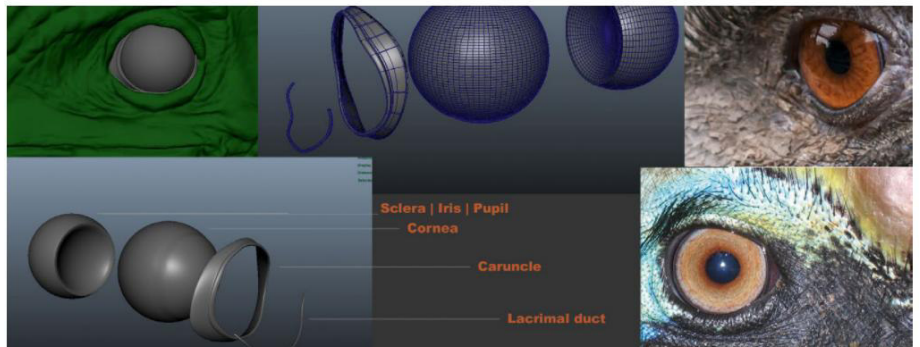
EXPERT TIP

Add extra lights
Using only an HDR light can make your lighting look really flat, so add extra lights to incorporate a more realistic feel to your render.



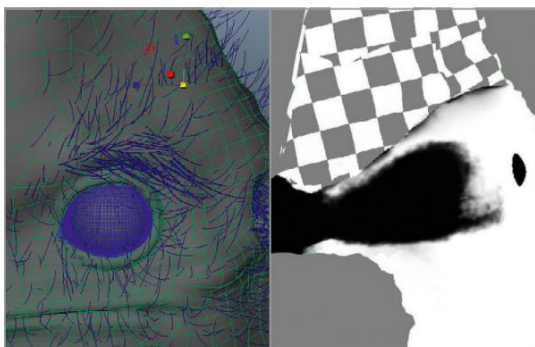
15 LOOK DEVELOPMENT

I use V-Ray 3.0 for the look development process. Using a blend material, I separate the casque from the skin using a mask created in Mari and I also create another layer for the Dirt pass using another mask. Doing this means I am able to dial the shader separately, since the casque has different properties from the skin.



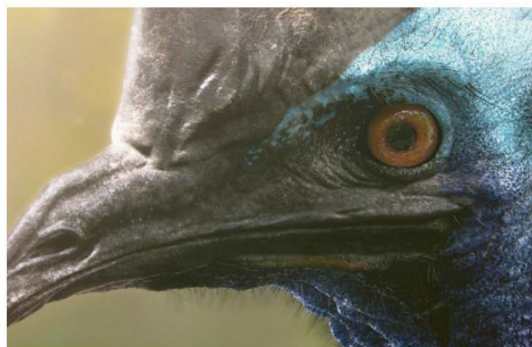
16 EYE LOOK DEVELOPMENT

I don't have a complicated setup for the eye. I have four different pieces: iris, cornea, lacrimal duct and caruncle. The iris geo has a concave shape and the cornea convex. This means I am able to achieve depth and realism with the eyes without getting into complex shading. Next I use a glass material on the lacrimal duct and cornea geo, and a simple V-RayMtl for the cornea and caruncle.



17 ADD FUR AND EYELASHES

To add some realism, I add some fur to the cassowary using V-Ray Fur. The setup is really simple and it makes a huge difference to the final result. I also paint a mask in Mari to decide where the fur would be placed. The eyelashes are polygon cones with different sizes. All are manually placed; it is a simple but tedious task but the variation creates an organic and realistic look to the bird.



18 FINAL PASSES/COMPOSITION

After finishing the look development I take the passes into Photoshop to begin the comp process. I use the Z-Depth pass to give a natural and photographic look to the scene, and I also add a few colour correction layers. The last step is to add post effects to the scene, which are Vignette, Chromatic Aberration, Lens flare and Noise. ■

I use the Z-Depth pass to give a natural and photographic look to the scene... I also add a few colour correction layers



SUBSTANCE PAINTER | ZBRUSH

CREATE GAME-READY, REAL-TIME TEXTURES

Sébastien Giroux shows how to create beautiful textures for video game production using Substance Painter



ARTIST PROFILE

Sébastien Giroux

Sébastien is a senior character artist at Activision Quebec, currently working on the Call of Duty franchise. He has been working in the video game art industry for almost a decade working for studios, like Ubisoft Montréal on many of their IPs. www.artstation.com/artist/hellrainbow

This past year has been a game-changer for the video games industry and for us artists lucky enough to earn a living from making games. The emergence of physically based rendering (PBR) has changed the way we create textures and materials for game engines, and with it, software has emerged that you need to master. In particular, Substance Painter has become a standard in the industry; it's a terrific software that is a part of the Substance Designer suite. In this tutorial we'll learn the core skills needed to create real-time, game-ready textures in Painter.

Photoshop has been a staple of my workflow for years but Substance Painter offers some major gains to stray from its path,

for example instead of texturing with photos on a flat 2D canvas, you are now able to 'paint' on a 2D canvas. At the same time, Substance Painter offers you the ability to do this in a 3D viewport.

One of the mindblowing abilities of the software is it enables you to texture in multiple channels (albedo, glossiness, metalness) at the same time and then you can reuse this materials' recipe quickly on other 3D models, in seconds.

Texturing a series of vehicles, props or characters that are part of the same theme or factions with similar material types becomes an easier task as you can reuse the same materials across all of them. Texturing has never been quicker and it's easy to use all of this while maintaining the PBR accuracy.

And it doesn't stop there. One of the many great things with Substance Painter is the ability to use the colour ID map that is generated from ZBrush and baked into Substance Painter. This can be used as a mask for materials/texture applications baked from the high-resolution details in ZBrush.

The other great thing is you can now bake normal maps by name – you don't need to break up your low-polygons (LOD0) in order to bake them. So you can avoid a projection overlap in your normal maps, as the two geometry objects are too close together – even at a low ray distance value. This avoids having to make corrections in Photoshop, which can be a pain.

For all the assets you need go to creativeblog.com/vault/3dw208

EXPERT TIP

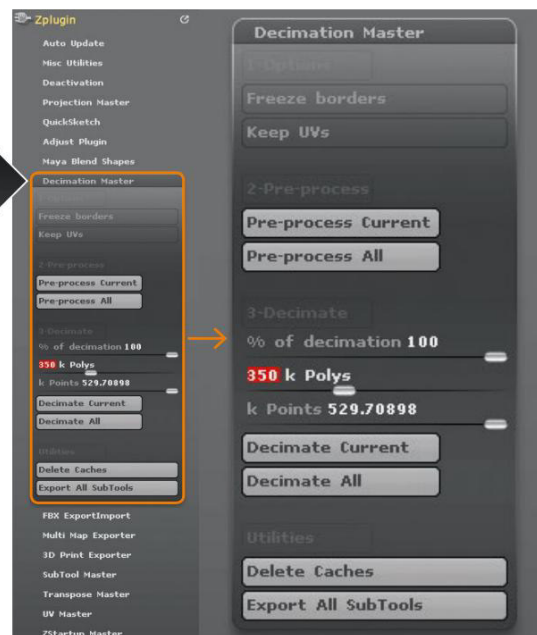
Decimation

Keep in mind the decimation you see in ZBrush is without any smoothing groups or soft polygons; they are all hard polygons and many of those hard artifact details won't appear in the normal map baking result.



1 START WITH DECIMATION

You need to decimate as much of your individual parts as you can. This will accelerate the baking process time and you will have a usable high-res mesh if you need to retopologise. For decimation, a good rule of thumb is try to aim for 300-350k polygons in ZBrush. If too much of your detail gets washed out during the first pass of decimation try a higher count, or if nothing changes try a lower polygon count. The goal is to get the best result with the fewest decimated polygons.



TOPICS COVERED

- Baking textures
- Modelling
- Polypainting
- Texture maps

IMPRESSIVE TEXTURES

Substance Painter has become an essential tool for creating high quality real-time textures



REAL-TIME TEXTURES

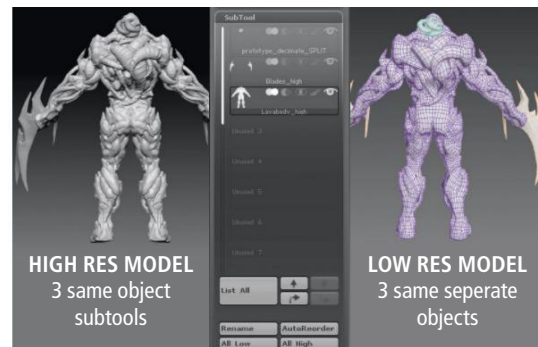
Master the new tools of Substance Painter and create dynamic textures



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2 USE DIFFERENT POLYGROUPS

For this stage of the process you need to break your ZBrush models into different polygroups. Ideally the same material type and same wear and tear should be on the same polygroup colour. You need to do this from the start of the sculpting phase in order to define which parts will have different materials, and from there try to keep them as different subtools or elements for fast and easy polygroup assignment.

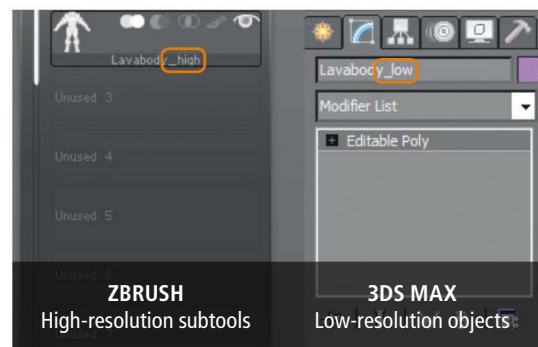
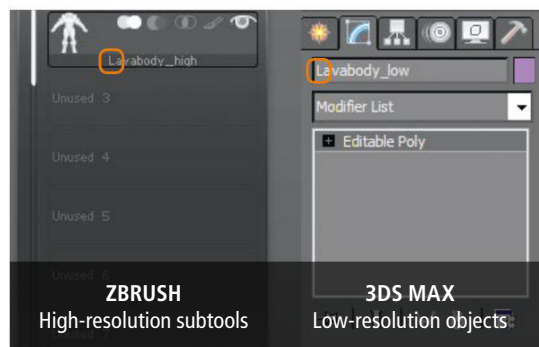
3 MOVE YOUR MODEL

Once you create your low-resolution model (LOD0) take this into the 3D software of your choice – I would recommend 3ds Max, TopoGun or Maya. Usually your model should combine or attach all of the 3D objects on the same type of texture map. With this done, it will be easier to assign them a name ready for baking the normal maps.

EXPERT TIP

Don't forget about your underscore

You can't type an underscore (`_`) in ZBrush, so therefore you will need to paste this in from 3ds Max or another app, to make it work. By default, Substance will look for `_low` or `_high`.



4 RENAME YOUR MESHES

You need to rename your meshes in ZBrush and in your low-resolution 3D package (3ds Max, Maya, and so forth). This is where most of the problems occur. In ZBrush, by default, the software adds a capital letter to all the names you input in the rename part of the subtools, so be sure to add a capital letter to the first letter of your naming convention. Also avoid numbers, as Substance won't support them and it will cause problems at the baking stage.

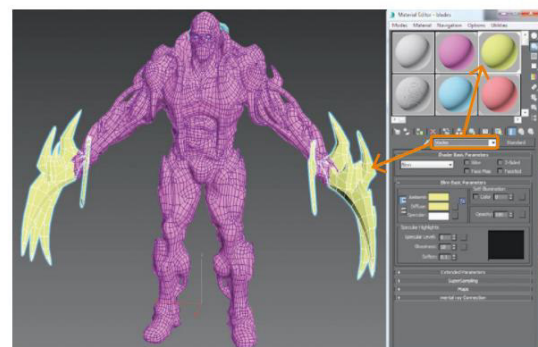
5 RENAMING CONTINUED

By default, Substance Painter baker will look for names with a `'_low'` and `'_high'` modifier to link them to each other and bake from there. Once again, it seems in ZBrush you can't input the `'_'` so you will need to copy and paste the name from the low resolution model, and then copy and paste the name in ZBrush, renaming the subtool and erasing the `'low'` at the end to replace it with `'high'`. This way you ensure the exact same word carries across.

RETOPOLOGY IN VIDEO GAMES

Choose your method before you begin

There are many different approaches to retopology for an in-game asset. One of these approaches is to model a low-resolution mesh with a polycount close to what you want to use in the game. So start your ZBrush model in high-res polygon sculpting, using this as a base (subdivision level 1), but constrain it by a defined topology, so no ZRemesher or DynaMesh is allowed on this mesh. This can be a problem, so you need to plan your base mesh to so that there's polygon detail in some regions of the model, where needed. The other approach is to start with a base mesh without any regard for the topology – just get the scale and proportions right, and then work from there to get the high sculpt. After this, do a retopology from the decimated high-res mesh by snapping the polygon on the surface (3ds Max Freeform Tab>Extend or use TopoGun).

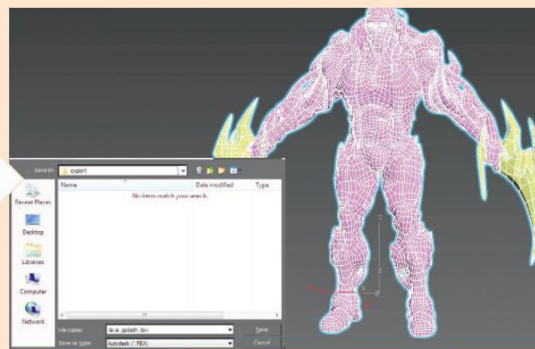
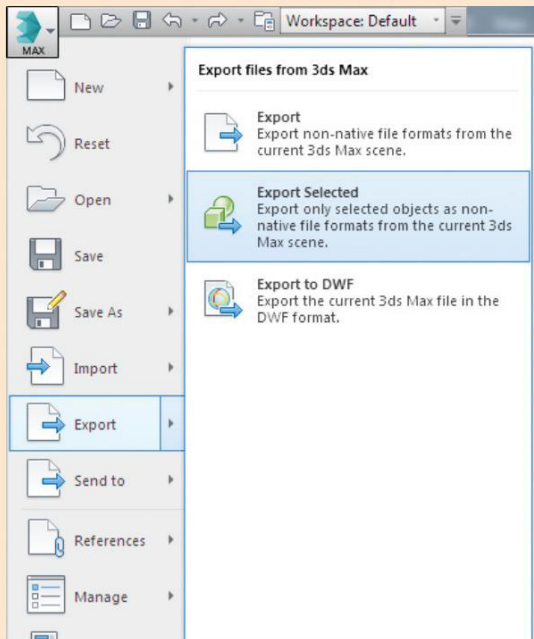


6 POLYPAINT FROM POLYGROUPS

We need to prepare the colour ID map that will be really useful in Substance Painter. First you need to assign the correct colours in ZBrush. All your polygroups should already be assigned by material type on each subtool, so the only thing left is to do a Polypaint From Polygroups (found under the Tool palette) on each of the subtools.

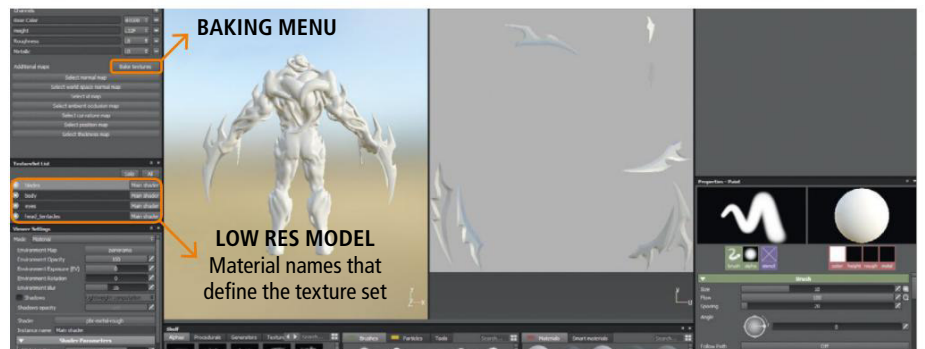
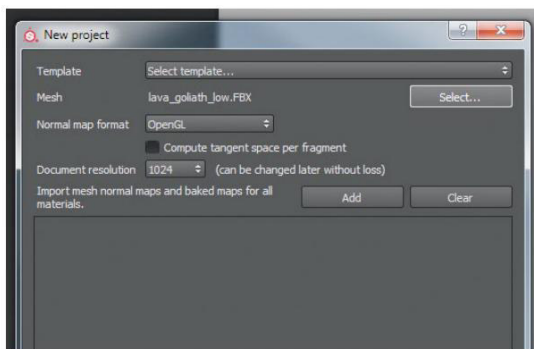
7 ASSIGN BASIC MATERIALS

We need to assign the basic materials from Maya/3ds Max. It doesn't matter as long as each material assigned represents a texture map on your model. If you have three textures you should have three materials assigned to them by polygon face or polygon object. Each material needs a specific name that defines which type of part or texture it represents. That name will be your reference in Substance, so you know which texture is what on every texture set.



8 EXPORT TO ZBRUSH

Now that our materials' names and polygon mesh names have been assigned, we can export our ZBrush high resolution model and our low resolution model in the .fbx format. The great thing about ZBrush FBX is that it can export all your separated subtools as one, and when loaded in Substance, the format will remember they are separated. You no longer need to export your .obj subtools and combine them in Maya/3ds Max like the old days.

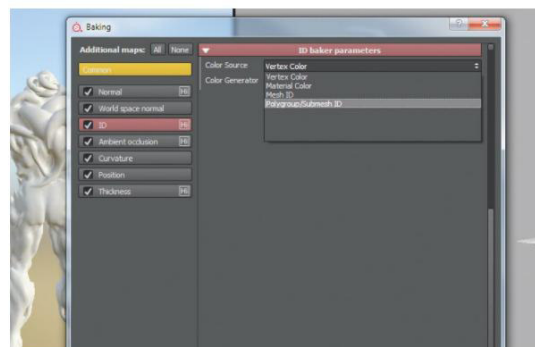
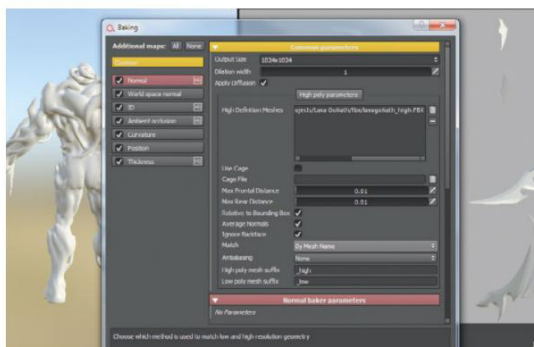
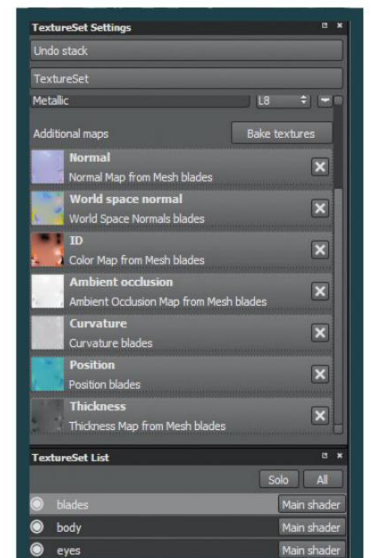


9 IMPORT TO SUBSTANCE

Finally we make it to Substance Painter – this is where the fun begins! Go to File>Start New. Now you need to get the low resolution .fbx that we recently saved out of ZBrush, by pressing the Select button. Now we have our files inside Substance Painter and can start the texturing project in detail.

10 INSIDE SUBSTANCE PAINTER

Now that you've loaded your low resolution mesh, you should see the different texture sets with the names that you wrote before exporting into your 3D software. You can also see the channel that you will be using, and you can add more or remove some, depending on your needs. At any time you can also switch the resolution of your project, and as long as you're using Substance materials and effects, you will never lose detail when upscaling the resolution.



11 THE BAKING MENU

Once in the Baking menu you can set the resolution of the baked maps. You can also load your high resolution decimated .fbx file from ZBrush by clicking on the small page icon next to the high resolution meshes square. By default you are in the normal section, so go to Match and switch the default setting of 'Always' to 'By Mesh Name.'

12 BAKE YOUR TEXTURES

Now go to the ID menu inside of the Baking menu. From here select the Colour Source menu and scroll down the bar until you reach the Polygroup/Submesh ID option. Now you should be all set, so simply press Bake Textures. Now all the textures should be located in the additional maps that you just baked. If you want to modify them in Photoshop, you need to export the textures by selecting them from the Additional Maps menu. ■

BAKING POSITION

Check your model's position

When you bake the position texture, it's important the model is in the same position as it'll be in-game, as many generators and effects use those maps to react, and the result will be wrongly driven by that Texture map. If you bake the low-res model in a bad rotation position you'll need to repositionate your model, re-import into Substance, then re-bake the Position maps.



MAYA

HOW TO MAKE A FLEXIBLE RIBBON RIG

Josh Carey reveals how to use ribbon rig techniques to create the right amount of squash and stretch in your animations



ARTIST PROFILE

Josh Carey

Josh is the head of rigging at Reel FX Studios and co-founder of the online rigging school, riggingdojo.com. His recent work includes rigging for Looney Tunes 3D Shorts. www.cgjosh.com

Ribbon rigs are fairly common in production rigs these days. They have a similar behaviour to using a spline IK setup, but can be easier to set up and have additional layering benefits. In the following tutorial, I will demonstrate how to set up a simple ribbon rig to simulate jiggle and bend, and then we'll take it a little further with some advanced techniques.

The rig I'm using in this training was based on one created for the short animated film *Wildlife Crossing* by Anomalia; the

ribbon rig technique proved pivotal in creating the jiggle and bend of the cartoon snail's eyes, chest and tail. Using the same technique, you'll be able to achieve similar results in your own animated projects.

We'll be looking at setting up a basic node setup and how to use layers of controls to get the desired results – being able to maintain close control over your rig is important. Then we'll develop the ribbon rig technique and look at advanced options and bonus options to take the

jiggle simulation a step further. Everything that you'll learn here will be the groundwork for your own projects, and from here you can keep experimenting with the techniques.

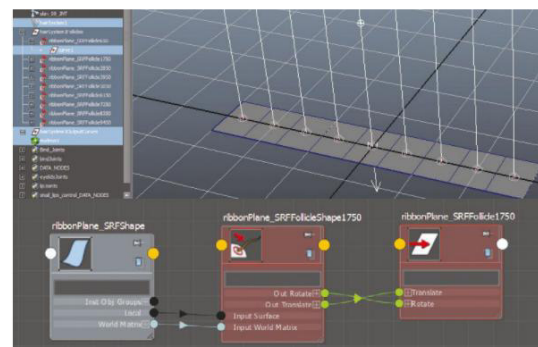
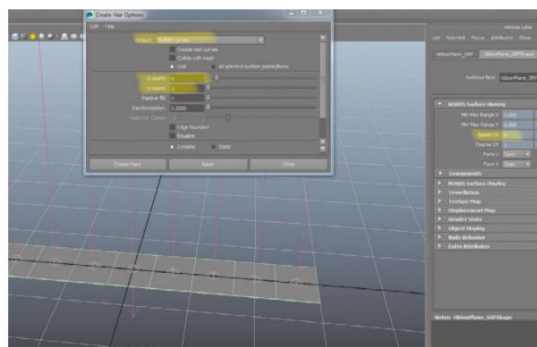
In the online Vault you will find step-by-step images that you can download to take a closer look at my settings and setup. I've also included my Python script code in the download so that you can try out the advanced options. I hope you enjoy the tutorial!

For all the assets you need go to creativebloq.com/vault/3dw208

EXPERT TIP

Follicle shape

Make sure you create your surface with the U direction following the length! Follicles aim down that direction by default, so save yourself some trouble by ensuring you're going down the U. If you don't do this, you can flip the follicle direction on the Follicle Shape node. If you forget about this, you will see shearing in your mesh that you end up skinning when the ribbon starts bending.



1 BUILD RIBBONS & FOLLICLES

Create a nurbs plane and scale in X with some spans. Make it so the joints/follicles are between spans. If you have them right on the spans, then you might have trouble getting them to aim between each other properly. Now go to the nHair menu and create a Hair option box. Change the options from the default. Set the V count to 1; you want to control how many follicles you get along the U. Match the U count to the U spans to get the right value.

2 FOLLICLE NODES

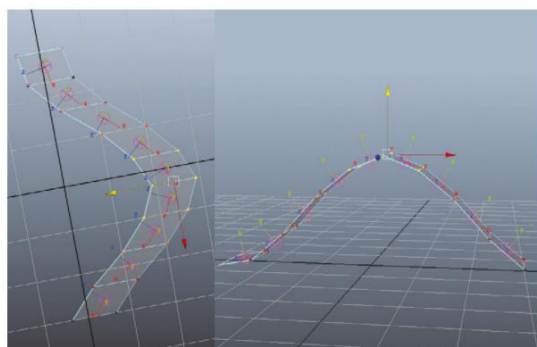
Now you can delete the highlighted nodes that you see in the screenshot above. The curve nodes under the follicles can be deleted since we're not using actual hair, just the nodes that the tool created. Using the Create hair menu is just a quick and easy way to make follicles on the surface. Alternatively, you could create the nodes by hand (createNode follicle) and then you would have to hook up the surface shape and transforms yourself.

TOPICS COVERED

Ribbon rigs
Follicle nodes
Stretchy rigs

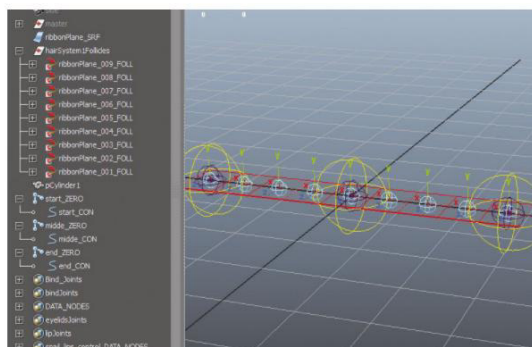
SNAIL JOURNEY

Josh used ribbon rigs to create the flexible snail in Anomalia's animated short Wildlife Crossing



3 ORIENT YOUR JOINTS

For each of these follicles, you'll want to put joints under them and use these joints to skin your mesh to; at this point, moving the nurbs surface around will make the joints follow. Test it out: manipulate the CVs to see how the joints react. Turn on the local rotation axis (Display> Transform Display>Local Rotation Axis) to see how they keep their orientations along the surface. Make sure you undo any movement on those CVs though – we want to continue with the surface in its default position.



4 NOW ADD THE CONTROLS

My snail rig's eye stalks use multiple sets of controls. The first layer is a simple 'start middle end' setup, so let's start with that: Save your file and go ahead and duplicate the start, middle, and end joints that you have on the follicles, and unparent them. Duplicate again, name one set _ZERO and the other set with _CON. Parent the _CONs under the _ZEROs, and add some curve shapes to them for selection purposes. Check your hierarchy against the image.

EXPERT TIP

Nesting joints

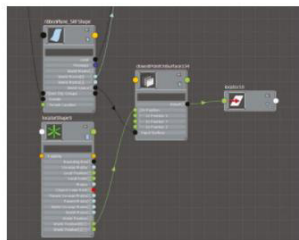
I tend to use joints with shapes under them (nested under other joints) as controls. Nesting joints under each other enables you to zero out all transforms on the control joint as well as making it a really easy way to get the orientations matching the originating chain from where you duplicated the joint.

CHECK HIERARCHY

Check your hierarchy against the image; you can colour the shape nodes by using the Override Color options in the Attribute editor

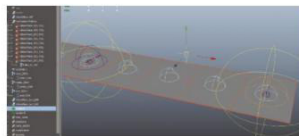
SCRIPTING

CREATE FOLLICLES AT SPECIFIC LOCATIONS



ONE VISUALISE

To visualise how you will make this script work, make two locators. One is going to be used as a location object while the other is going to be the output location on the surface. You will need to make a `closestPointOnSurface` node for this.



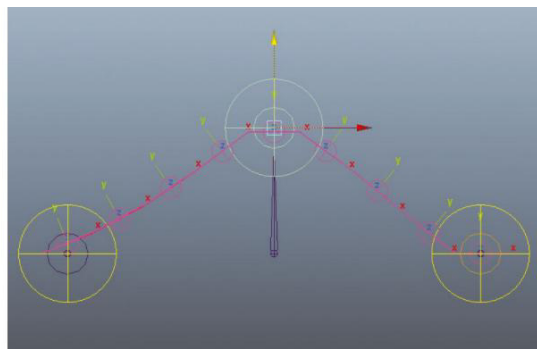
TWO OUTPUT

After making the proper connections (use the previously made follicles to see what those should be), output the result position from the `closestPointOnSurface` to the second locator.



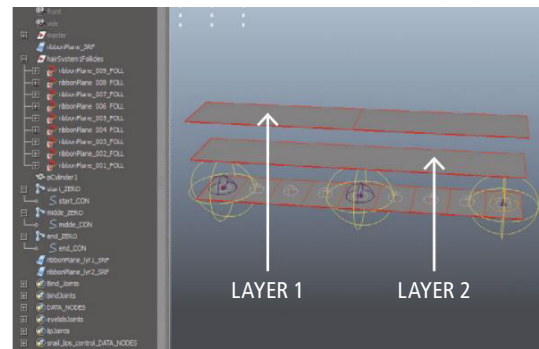
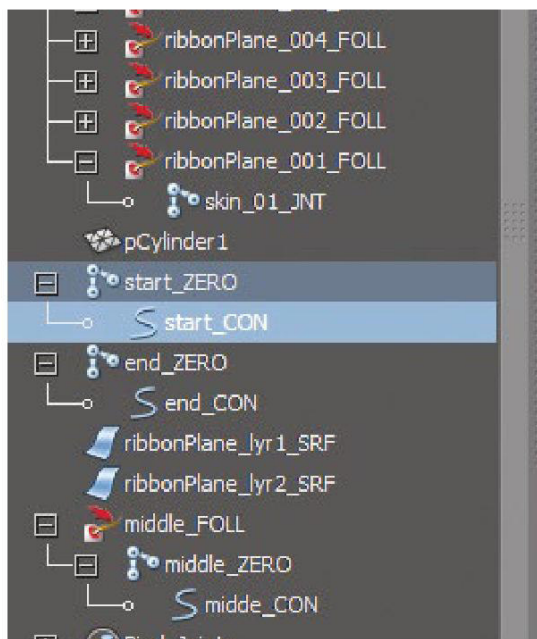
THREE FIND VALUES

You can now find the U and V values that a follicle would need by looking at the resulting U and V parameters on the `closestPointOnSurface` node. By using this process, you should be able to deduce how you would go about this by code. Comment out the process for your function and fill in the gaps with real code.



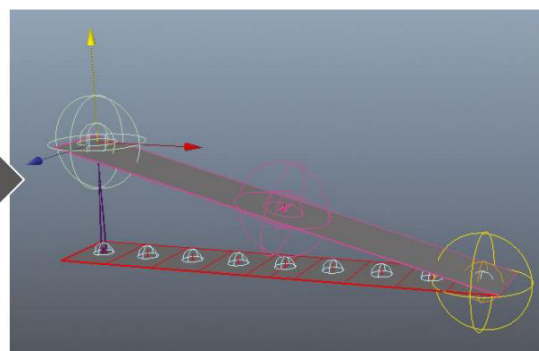
5 SKIN THE RIBBON

Since the controls we made are joints, we can skin the ribbon surface to those. Always skin with the option of selected joints, and select only the `_CON` joints we made. Smooth out the weights after skinning so the ribbon deforms evenly and lock the start/end spans so they don't move when the middle moves – or choose to have them aim. This is a behaviour decision for your animator. If you have the ends 'aim', tweak the weighting on the CVs to get a little influence from the middle joint.



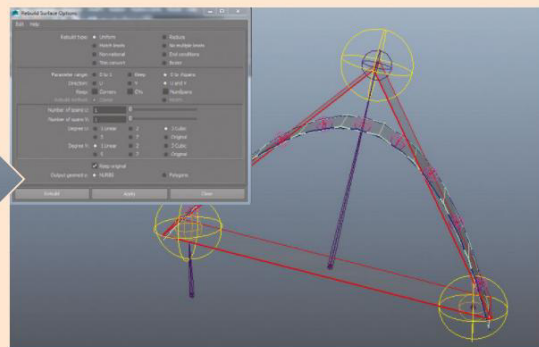
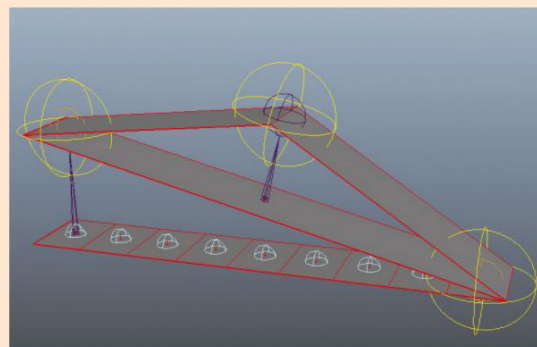
6 LAYER IT UP

Put your `ZERO` nodes under your rig. (If you want a bendy arm section, put these joints under your forearm joint, and the arm will be skinned to the joints under the follicles.) Let's take this further and add some layered control. Go back to your saved file (where the ribbon is unskinned) and make a new ribbon surface that has 1 span in each direction; duplicate the original ribbon surface then remove all the inner CVs from that duplicate.



7 MORE FOLLICLES

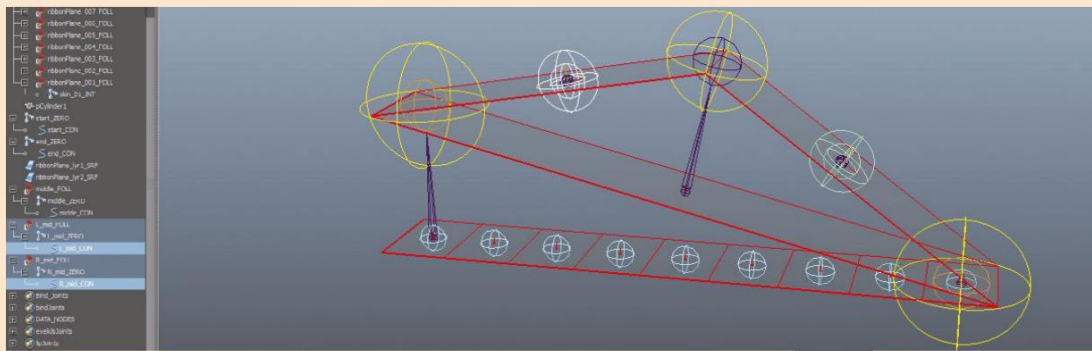
Let's take the layer 1 surface (1x1 spans) and skin that to the start and end controls. This surface should drive the rest of the layers that you make, which means the mid control should be attached to the surface. Starting with the current middle control that you already have, let's make a follicle on the layer 1 surface at the location of the `middle_CON`.



8 ADDING MORE LAYERS

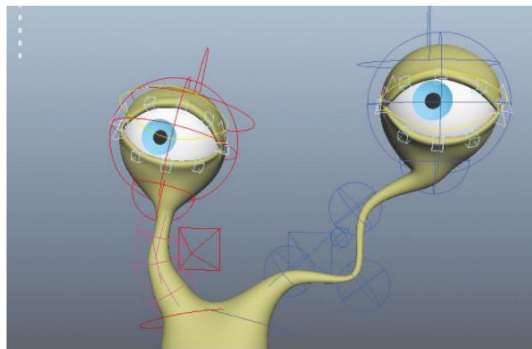
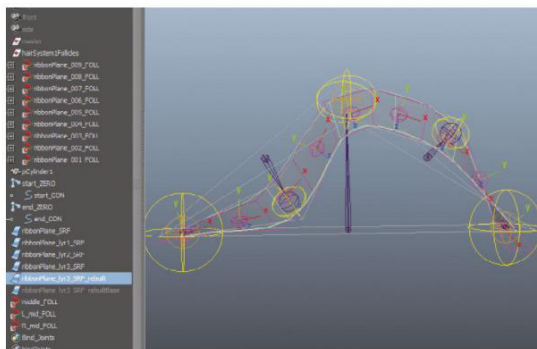
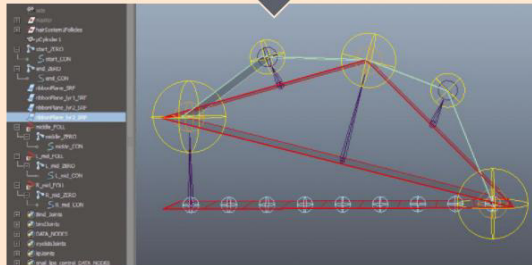
Now take the layer two surface, and skin that to all three controls (start, middle and end). We continue to have multiple options on how this rig ends up. We could end it right here and simply wrap the original surface to layer two. However, to get a smoother result, we could use the Rebuild Surface option to give us a cubic surface to wrap to, rather than a linear one. Use the `Edit Nurbs>Rebuild Surface` menu with the layer two surface selected. Make sure that Keep

Original is checked. Now you should have a little play around with the controls so that you can see how the surfaces are affected. You can see the rebuilt surface with history from the layer two surface. By making the rebuilt surface cubic in the U direction, the result is a smoother surface. Here's what it would look like if we wrapped the original surface to the newly rebuilt, cubic layer two surface.



9 MORE OPTIONS

Let's back up and add an extra layer of control. Duplicate the inbetween joints on each side of the middle control (joints 3 and 7 in my example). These will become new controls to use. Follow the previous steps to put them under follicles that are attached to layer two's (the linear) surface. Create a new surface with more spans (at the location of the new mid controls), and this surface will be skinned to all the controls we've created so far.

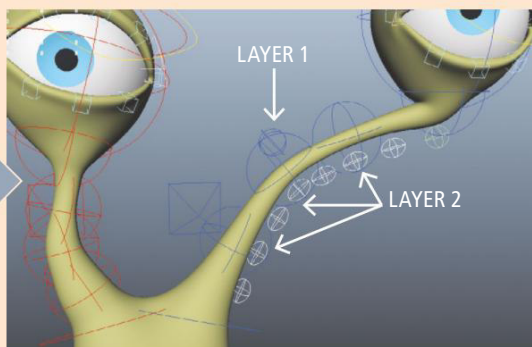
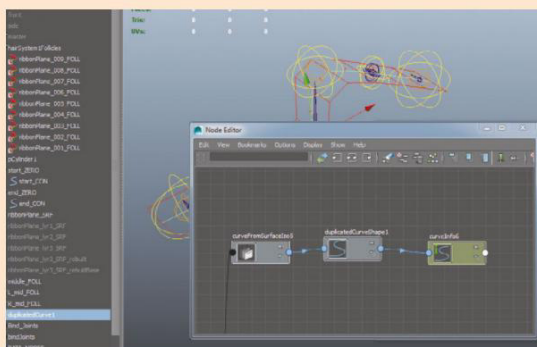


10 WRAPPING UP

To bring it all together, use the rebuild surface trick on this final third layer ribbon. Play with the Rebuild Surface options to get the right amount of bendiness that you want. Once you're done, you can wrap the original surface to this new third layer's rebuilt surface. Alternatively, you could just recreate all the follicles on the layer 3 rebuilt surface, and put the skin joints under those. This would get rid of some extra calculations from the wrap node.

11 BONUS FEATURES

You can take the rig further by adding scaling features. Once you get a mesh skinned to the skinning joints, and have it stretched out, you may notice that the mesh doesn't maintain uniform stretching. This is because our joints aren't actually scaling; they're just translating away from each other. This may be OK in a lot of cases, but if you do need to set up scaling, you would go about this like you would with an IK spline rig.



12 SPLINE TECHNIQUES

Grab the original ribbon surface and go into Isoparm mode. Select an isoparm at the 0.5 mark in V (for example, select `r.ribbonPlane_SRF.v[0.5]`). Use the **Edit Curves>Duplicate Surface Curves** menu item to duplicate that isoparm. This will give you a curve that follows the ribbon, by keeping its history. You can then use that curve to plug into a `curveInfo` node and set up your typical squash and stretch node networks. There is no limit to how many layers

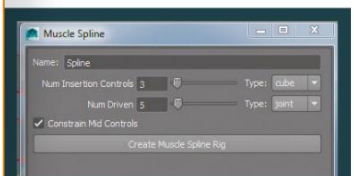
you create, so make sure that you experiment with these techniques and try to explore more on your own! Plug the curve shape into the curveInfo node to obtain the arcLength. Use this to drive how much stretching happens on the joints attached to the surface. Here's a final look at the ribbon used on the snail's eye stalks – three layers, with the final layer being the actual individual control over the skinned joints. This was necessary to achieve some of the waving effects. ■

EXPERT TIP

Embrace the complexity

Try not to be confused or overwhelmed by the amount of options; rigging is all about finding the best solution for what you need. I'm just showing you the options and you will have to decide what works best for you!

Play with the Rebuild Surface options to get the right amount of bendiness that you want



ADDING JIGGLE

Use the Bonus Rigging Muscle spline creator

You can use the Bonus Rigging Muscle spline creator in place of ribbon rigs if you'd like, as they also give you the option for adding jiggle simulation. You can find this under the Muscle menu>Bonus Rigging>Create Muscle Spline. Sometimes you will find it better to create your own ribbon rigs though, as you'll see that you have more options available to create the layered technique, as well as better control over how the joints/controls aim at each other (for example, the skinning of the ribbons). Experiment with the options to see what it builds.



If you see the Play icon,
use the link!

3DSMAX | ORNATRIX | MARI | V-RAY | NUKE

CREATE STYLISED FUR FOR CREATURES

Ludovic Lieme shows the process for creating a furry character from scratch, with the help of Ornatrix



ARTIST PROFILE

Ludovic Lieme

Ludovic is a CG generalist artist based in Paris who has worked in the advertising, animation series and feature animation movies sectors.
www.artstation.com/artist/ludoviclieme

Creating a fur character can be easy, but if you want it to be really appealing you will have to pay attention to detail and keep it organised.

I will show you the different steps I went through to create this little furry creature. This tutorial will mainly focus on my workflow for fur creation, like separating the model for the fur, map creation in Mari, fur shading, and preparation for the rendering in V-Ray. I will also go through over some important steps like reference research, modelling and compositing – however, I will keep that as short as possible.

For this project, I chose to create a cartoonish hedgehog because of the characteristics that it has – namely two different types of fur. But I also chose this cartoon style because it's cute! The workflow that I'll show you can also be applied to animated characters, but I will come back to that later.

For those of you who would like to see the project in more detail, you can follow the video showing the fur creation steps. You can also download the final scene with the model, textures maps and render settings in V-Ray. I hope you'll enjoy it – let's get started!

✓ For all the assets you need go to creativeblog.com/vault/3dw208

EXPERT TIP

Mari procedural mapping

There are a lot of custom procedural presets that Mari provides, but you can also find some free pretty cool ones on the internet and import them into Mari.

TOPICS COVERED

- Modelling prep
- UVs and fur textures
- Fur grooming
- Shading and rendering fur
- Compositing



1 SOURCING REFERENCES

Before beginning any project you need to find good references! I usually begin my research with Google and Pinterest to find anatomy references, real-life images, posing, gestures, and so forth. I also try to find inspiration in more artistic websites like ArtStation or DeviantArt. It's great to look for inspiration but don't forget to mention an artist when you're using their work. Now I start modelling, you can see my process in the downloadable videos.



CLICK TO PLAY VIDEO
www.bit.ly/208-fur-1

CUTE COMPANION

Ludovic chose a cartoon style hedgehog as it has two different types of fur



2 MODELLING AND UVS

When you're creating a fur creature, always keep in mind that the base model will be under the fur. Try to find the right balance between the modelling under the fur and the volume/shape that the fur will have after you've stylised it. I chose to have a more accurate shape on the front, whereas the back will just be there to put the spikes that I'll stylise during the grooming phase.



3 TEXTURING WITH MARI

As the texture will be under the fur and will drive its colour, I usually start painting with simple flat colours to give the overall look. Then I use gradient and some colour variation to add details that will be seen on the fur during the rendering. For more details, I also add multiple noises with slightly different hues. It gives your model a skin-like painted look. Try different noise sizes in order to break the repetitive look.

COMPOSITING POWER

Source the right information

The more you can 'cheat' in compositing, the less your render time will be. Sometimes it's more efficient to work on your image in post production without having a headache with the rendering. Find the right amount of detail you need in your image for rendering and do the rest in compositing when it's possible. This will train you to find a quick solution to a problem and furthermore, bring more efficiency to your workflow.



CLICK TO PLAY VIDEO
www.bit.ly/208-fur-4



CLICK TO PLAY VIDEO
www.bit.ly/208-fur-5

4 QUICK SETUP AND POSING

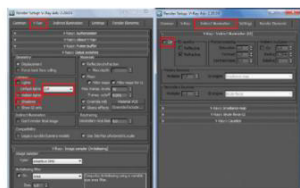
For the posing, even if it's an animal, I like to use 3ds Max biped setup. Because I'm not a rigger and I don't want to waste time on the setup, biped setup is a good alternative. You can create a quick setup that will pose your character with extra bones, for tricky parts. If the biped limited your posing, you can always retake it with an Edit Poly modifier on the top.

5 SCENE BLOCK AND PRELIGHT

I wanted to create a scene that my character can live in. I created a towel, which I simulated using the 3ds Max Cloth modifier. When I'm happy with the result, I start to add lights to make the scene appealing. I try to keep my lighting as simple as possible, for example one Dome light HDR with a low intensity to colour the shadow, one Key light to give a direction, and one Rim light to detach the character.

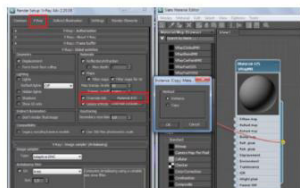
V-RAY
RENDERING

AMBIENT OCCLUSION FAST RENDER AN OCCLUSION SCENE



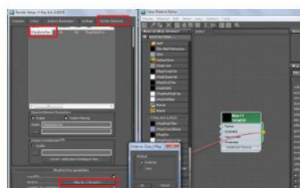
ONE KILL ALL LIGHTS AND GI

Just go to the V-Ray Render Setup tab, in the Global Switches tab and uncheck Lights, Hidden Lights and Shadows. In the GI tab, turn off GI.



TWO OVERRIDE THE SCENE MATERIAL

In the V-Ray Render Setting tab, in Global switches, check Override Mtl. Then plug in a simple V-RayMtl.



THREE VRAYDIRT AND RENDER

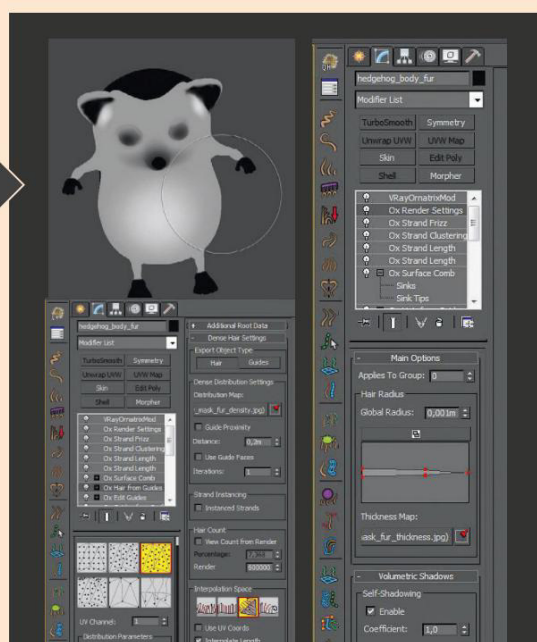
Create a V-RayDirt map in a V-RayExtraTex render elements and tweak the dirt, in order to achieve the look you want.



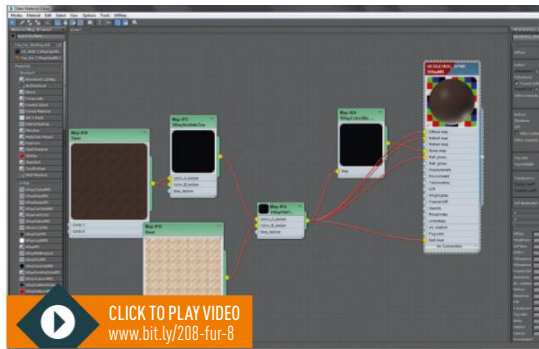
CLICK TO PLAY VIDEO
www.bit.ly/208-fur-6

6 BODY FUR GROOMING

I usually start with the Add Quick Hair button. I go to Mari to create a Density map to direct where the fur will grow. Then I add and adjust others parameters like Length, Frizz and Comb to create variation in the fur. It's the key to creating realistic fur. To have more control I add maps to tweak these parameters. In the OXSurfaceComb modifier, I like to create sinks that give the fur a direction.



CLICK TO PLAY VIDEO
www.bit.ly/208-fur-7



8 CREATE FUR SHADERS

For the body fur, I use a V-RayHairMtl. I use a preset to create a base, then I tweak the parameters. I plug my Diffuse map into the OxHair node's root and tip entries to give the hair its diffuse colour. For more variation, I play with the hue and value. For the spike, I use a V-RayMtl with a V-RayHairInfoTex to colour the tips. Dent maps are used for adding colour variation in the diffuse.



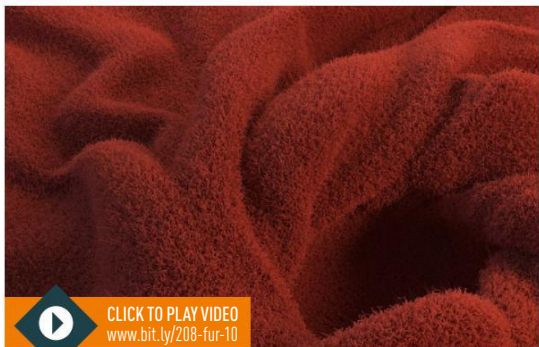
9 TOWEL FUR GROOMING

I create three different hair systems for the towel. One for the main fur, and two for adding details that I can have more control over. On the main one, I'm giving the fur a short length but quite a big thickness, with a lot of haircount on render (1 million per system). The other two are there to break the linearity and add some fluffy, thick fur with less haircount on render (10,000 per system).

ORNATRIX TIPS

How to avoid problems

First of all, try to work as much as possible in a unit scale that's not too big and not too small. You can use the Remember Root Positions button in the Ox Guides from Surface and the Ox Hair from Guides modifiers to avoid changing position during animation or when reopening a file. Sometimes playing around with the Root Distribution mode in the Ox Guide from Surfaces can fix issues like hair growing in the wrong direction. And of course, you can have a look in the Ephere forum, where users often post their problems. It saves a lot of time and prevents me from getting some serious headaches!



10 TOWEL SHADING

V-RayHairMtl is a very cool material which allows you to have a lot of control. For the towel, I chose to use a basic V-RayHairMtl with a red shiny preset, where I could change the diffuse colour to something more orange. For realistic fur (but longer render time), uncheck Opaque for GI and Opaque for Shadow. In the latest version of Ornatrrix, an intensity multiplier was added so I could easily control the colour intensity of the hair, without breaking the shader parameter.



11 ORNATRIX WITH V-RAY

To render realistic fur with V-Ray, you need to add some GI and use a linear workflow. The best setting to render on in order to avoid the hair flickering, is Brute Force as the primary bounce, and Lightcache as the secondary. If you want to render an animated sequence without the flickering issue, this is definitely the best way. You can also play with the AA filtering for smoother results on render, but it will be more time consuming.

EXPERT TIP

Faster fur GI rendering

If you're just doing a quick render test or using a low-res image, use the GI mode: Irradiance map and light cache. You will have an artefact in your GI render pass, as well as in the reflection, but it will render faster.

EXPERT TIP

Fur V-Ray render passes

V-Ray is a powerful tool that allows you to create fur render passes. Don't hesitate to create extra textures such as V-RayDirt (for occlusion), which can be really helpful for fur compositing.

VRAY RENDER



NUKE RENDER



12 FINAL NUKE COMPOSITING

I like to use Nuke for compositing because during the early rendering stage it allows me to set up a pipeline, to show how the final image will look. Since my hedgehog is very tiny, I play with the ZDefocus to add some macro effect. I separate all elements with the MultiMatteObject render pass in order to have full control over them during compositing. To finish, I add some lens distortion, vignetting and grain. ■

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HOW TO MASTER CREATURE ANATOMY

Aybars Turan collaborates with *Terryl Whitlatch* to create the écorché of the Pyrosuvivous



ARTIST PROFILE

Aybars Turan

Aybars is a character and creature artist who uses his fine art background to imbue his sculpts with life and realism. He works at Tesla Motors as a senior concept modeller.

www.aybarsturan.com

For this creature anatomy project, I had the privilege of working with Terryl Whitlatch. We worked on the skeletal, muscular and vascular system for this creature. You can also find the Pyrosuvivous in Terryl's book, *Principles of Creature Design*.

The purpose of this project is to create an anatomy of a believable imagined creature. Creating a creature that does not exist is already a challenging task, especially since we see creatures in movies, commercials and games, all the time. Making a non-

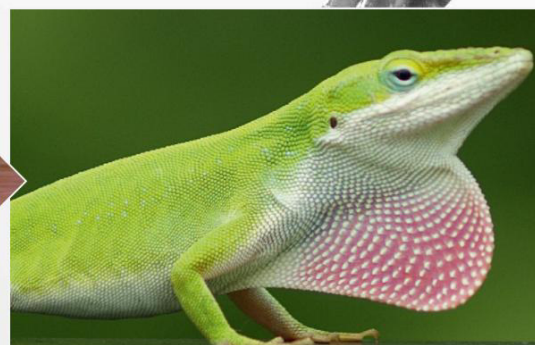
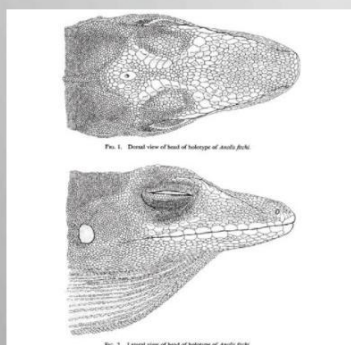
existing creature look believable and convincing is the hardest part. There are plenty of resources available on the human anatomy for artists, but not so much for imagined animals and creatures.

This project focuses on modelling a popular style of imagined creature: a bipedal dinosaur hybrid. The Pyrosuvivous is basically a mixture of a Tyrannosaurus Rex, Spinosaurus and Dromaeosaurids-like creature. Luckily, I had Terryl's scientific illustrations and collaboration to serve as a great conceptual

foundation for an inspirational and educational challenge. In this tutorial you can follow my step-by-step sculpting process, and advice on how to create a 3D print-friendly file.

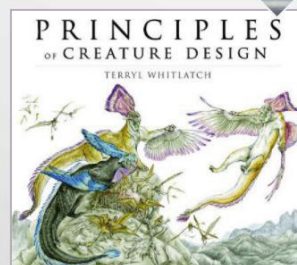
To help you follow my process I have created a video walkthrough of my work and you can download the 3D print-ready file for free and print your own Pyrosuvivous. Simply follow the instructions to the online Vault on this page, or turn to page 98 for more details.

For all the assets you need go to creativebloq.com/vault/3dw208



1 USING REFERENCES

It's helpful to find real life animal references for the part you are focusing on at a given time. For example, when focusing on the small, detailed scales, I relied heavily on the Carolina anole lizard and neighbouring species for reference. Many dinosaurs share anatomic features with chickens, especially in the limbs. In this case, I even kept many frozen chicken parts to have on hand as a real-life limb study. I also recommend *Unfeathered Bird* by Katrina van Grouw as a reference book.



TOPICS COVERED

Sourcing references
Concept art
Sculpting
3D printing

CONVINCING CREATURE

Making your anatomy
believable for an
imagined creature can
be a challenging task



FOLLOW
THE VIDEO

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POSING IN
ZBRUSHRIGGING AND POSING
YOUR CREATURE

CLICK TO PLAY VIDEO
www.bit.ly/208-dino-2

ONE RIGGING WITH ZSPHERES

Rigging in ZBrush with ZSpheres is fun and gives you really good results for posing your model. Use ZSpheres to create the main bone structure, just like where you would expect the articulation to happen in real life. Start adding extra ZSpheres around the areas that are going to be articulated more. Every ZSphere you add is basically linked to the skin, just like weight painting in Maya.



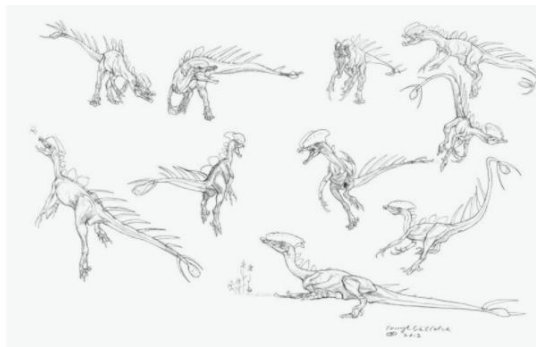
TWO POSING

I wanted to use a battle pose that Terry I already created. For a very dynamic pose like this, it's important to start moving the areas that have major articulation first. Always bigger moves to smaller moves. I look for lots of references of birds of prey, also known as raptors, since we can look to birds for similarity in structure.



THREE CLEAN UP THE DETAILS

Once the majority of the pose is there, I need to clean up the areas that are distorted. Here I use the Move brush a lot. Go back to the lower subdivisions and try to relax the surface according to the pose. I also add more extreme facial expressions with the Move brush.



2 DESIGN STORY

The Pyrosuvivous was originally created by Terry's rough compositional doodle and sketches based and inspired by the 1925 film, The Lost World. The Pyrosuvivous is a combination of at least six or seven different dinosaur species and is designed to be a scaly reptile. The chapter about the Pyrosuvivous is in Terry's latest book, Principles of Creature Design.



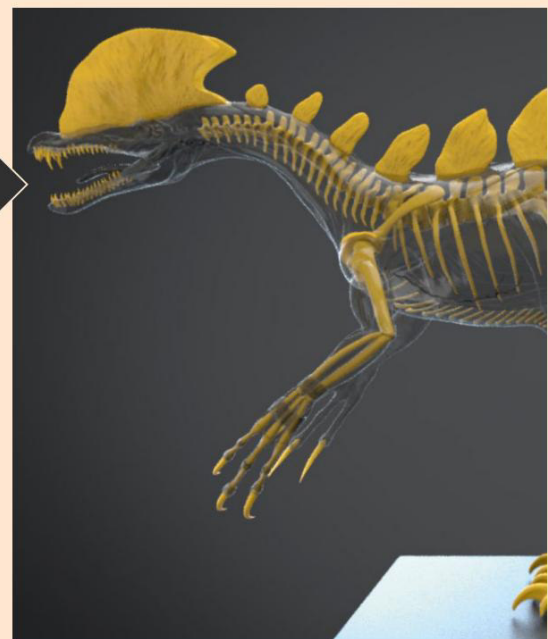
3 ZSPHERE BASE MESH

I use ZSphere to start my main base mesh. Depending on the project, sometimes I start with DynaMesh, but since I have incredible line drawings from Terry I started with ZSphere to have a little bit more control over my mesh. I turn off the perspective view and start to build my spheres. You can press [A] to see what your mesh looks like at any time. You can add volumes by creating more ZSpheres. Press [Q] to add more ZSpheres.



4 SKELETAL ANATOMY

Initially, building the skeletal anatomy wasn't required for this project, but I think it helps to understand the muscles and their transitions into bones, as well as understand the structure of the overall mass. Terry provided me with skeletal front and side view drawings for this task and I built them in ZBrush. If your final sculpt does not call for skeletal structure, I might still suggest completing it to help guide the rest of your muscle and tissue development.



CLICK TO PLAY VIDEO
www.bit.ly/208-dino-1

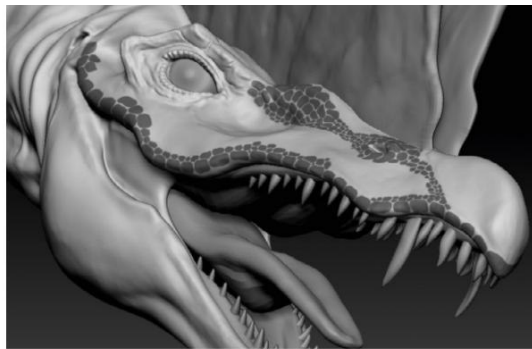
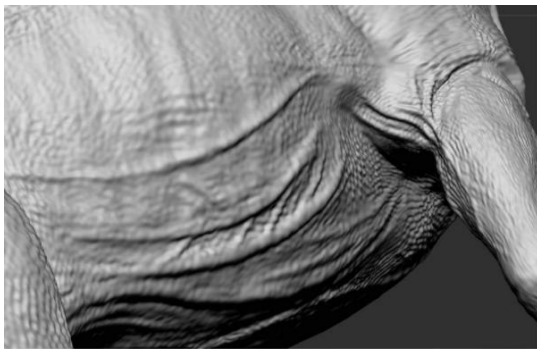
5 BLOCK OUT THE MAIN SHAPES

I have front and side view drawings, my base mesh and skeletal system. Now I'll spend time on the overall silhouette using the Move brush. Concept drawings should give an idea of body mass and shape, but don't get too hung up on the details yet; it's important to have a low-resolution model in the beginning while you are making big changes. Press the shortcut BMT for the Move Topological brush (to move vertices) and shortcut BMV for the Move brush (to move big mass).



6 ADD MUSCLE MASS

I use the Clay Buildup brush to add muscle mass. Next I isolate the areas that I want to focus on and work on them separately. Use the Clay Buildup brush, smooth it and gently draw muscle lines with the Dam_Standard brush. Slowly build up the fines of the form and move to a different part. Change the Imbed Intensity to 5 and Brush Intensity to 10 for the Clay Buildup brush. Go to Brush>Depth>Imbed. Imbed controls how much deformation the brush stroke will give you.



EXPERT TIP

Useful layering

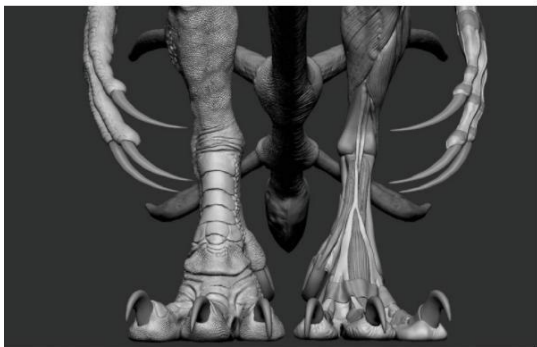
I keep the sculpting details in layers such as scale, distortion and fine detail. This way you can always play with the percentage of the detail that you want to see. Before you start jumping on to any other type of detailing, make sure you are on the right layer.

7 ADDING WEIGHT

Weight is one of the most important elements in organic forms. It defines the heaviness and gives us the sense of how this creature would fit into our world. Usually the areas that are intersecting, articulating or the loose skin and membranous parts will need the most time and polish here. If you don't add weight onto your sculpt it will look less organic. Try looking at your model with a shader that has specularity to see the surface highlights.

8 SURFACE DETAIL

Surface detail should be added last to make the surface look rich and vibrant; it shouldn't change the silhouette of the model. At this point I create the main scale patterns by hand, and for the rest of the details I use skin alpha brushes which you can easily find on ZBrush Central. You can also paint your surface details and convert them into Displacement maps to be projected in ZBrush. Both methods are very useful for creating surface details.



9 ANATOMY SIDE CARVING

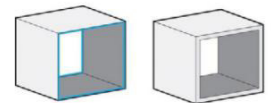
Once I'm happy with the overall weight and mass on this creature, I start carving my surface. As you start working on the major muscle groups and their relationships with the skeletal system, having access to your concept artist or using real animal references is helpful. I mainly used the Dam_Standard, Clay Buildup and Clay brush here. Working with layers at this stage is very important. I can keep everything organised with layering and take control of the blending.

10 EXAGGERATE FINER DETAILS

Details will often need to be exaggerated in order to be readable when printed. Fine scale details might look good on your screen, however when you 3D print them they usually get lost. The good news is, when you take advantage of your layers in ZBrush, you can adjust the exaggeration levels before you send it to be printed. I recommend giving an extra 2mm offset on finer details. Go to Tool>Layers then select the layer and change the layer intensity.

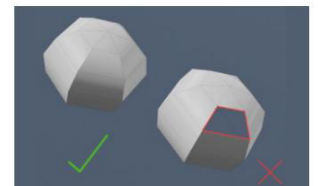
3D PRINT
READY FILES

CREATING 3D PRINTABLE FILES



ONE THICKNESS

Thickness is very important for creating 3D print-ready files. Usually, you need to give at least 2mm-2.5mm thickness to your mesh. Different software has different options for this process.



TWO WATER TIGHT MESH

Make sure you have no open faced holes, no unwelded verts or edges and no double sided face. You can only intersect parts if they are both watertight meshes.



THREE EXAGGERATE THE DETAILS

Make your details bigger. It might not look great on your computer, however when it's printed out it will look normal. This is going to be a process of testing and learning.



11 DECIMATION MASTER

I've included the decimated printable écorché of the Pyrosuvius as an .obj file. To buy the original ZBrush file with separated layers and subtools, go to www.bit.ly/208-dino. Decimation Master is simple to use: enter the number of polygons needed for the mesh or the percentage of the decimation needed. Go to ZPlugin>Decimation Master and hit Pre-process Current first and then Decimate Current. You can enter different numbers to re-calculate the decimation.



12 FINAL

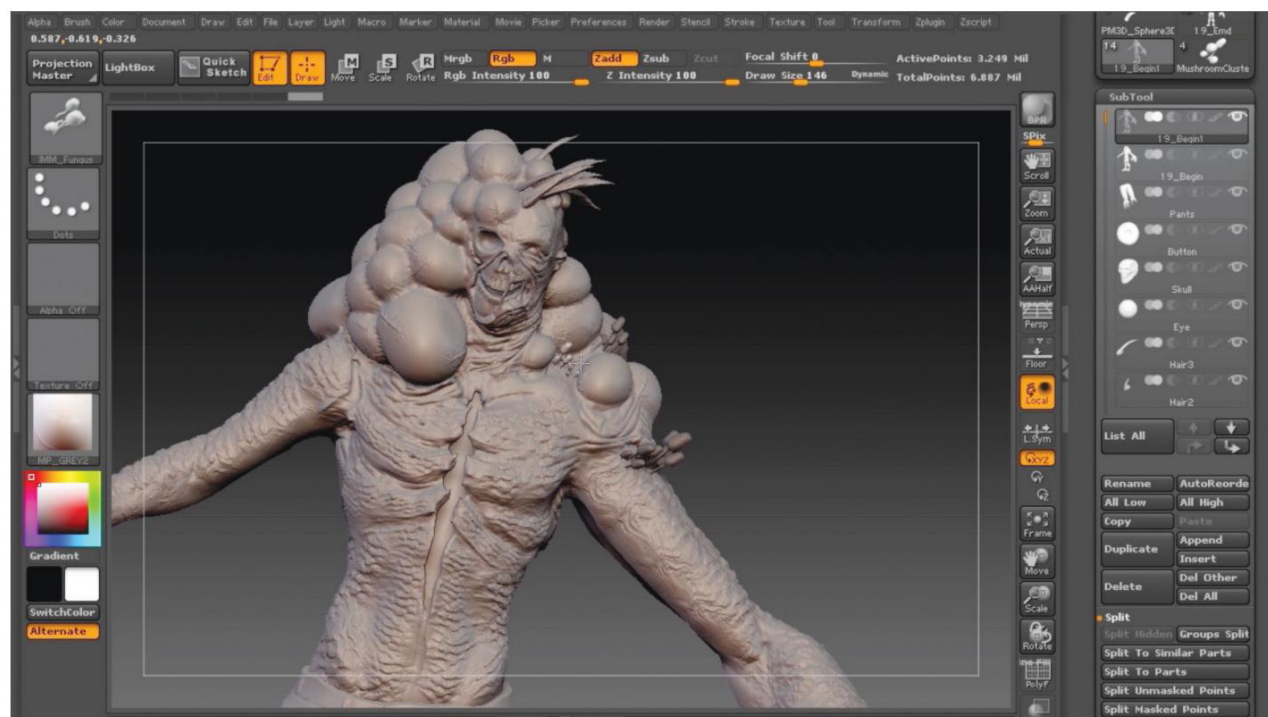
The more information and background you have about your creature, the more believable it will be. Nature is always the biggest inspiration and provides the guidelines for these types of projects. However, I hope that the Pyrosuvius can also be a tool to guide artists in understanding their creature subject inside and out. ■

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Sculpting Mutated Creatures in ZBrush is part of the Professional Series of tutorials created by Pluralsight, the world's largest online CG training library.

This high-level course is designed to evolve your workflow processes, refine your sculpting techniques, and master your design skills.

The objectives for this fast-paced, intensive course include breaking down a piece of concept art, morphing proportions from a human base mesh, and creating grotesque details like boils, ripped and sagging skin, and vicious claws.

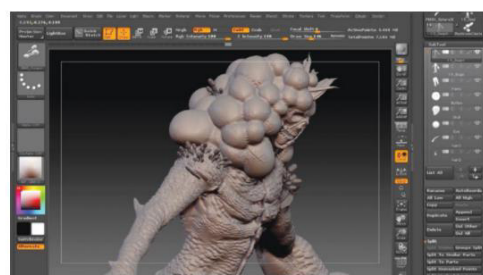
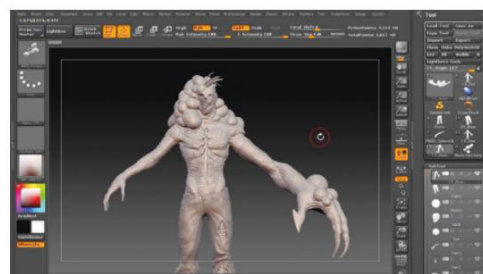
By the end of this training, you'll have the ability to make your own characters into horrific, mutated creatures. Before you start, it is recommended that you have experience using ZBrush, as the course covers what would normally take hours to accomplish in a shorter span of time. If you're an artist new to ZBrush, Pluralsight has introductory courses on their site.

FYI To find more high quality video training visit Pluralsight at www.pluralsight.com



About the artist: **Joshua Kinney**

Joshua is a devoted games author at Pluralsight. For years Joshua has been a key author behind Digital-Tutors' (now a Pluralsight company) popular game engine training. Joshua has devoted his life to creating games, as well as teaching others to build their own fantastic video games.
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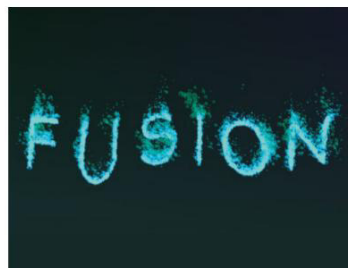
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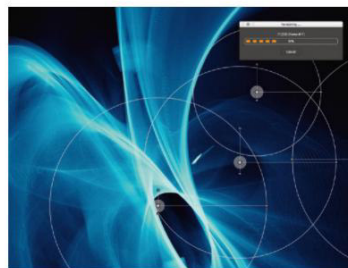
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V-Ray for Nuke techniques

In his final tutorial, *Josh Parks* shows how to master more advanced techniques with the plug-in



AUTHOR PROFILE

Josh Parks

Josh is a compositor at Double Negative and part-time lecturer at the University of Hertfordshire.

www.joshparks.co.uk

In last month's article I went over how to create and use the Position pass in order to generate custom mattes, to speed up our V-Ray for Nuke workflow. This issue I'm going to go over some more advanced V-Ray for Nuke techniques and ways to use them.

The majority of the V-Ray for Nuke nodes may feel familiar, allowing us to figure them out using logic and experience of standard Nuke nodes. Understanding these should complete your introduction to the plug-in and put you in a good place to efficiently use V-Ray for Nuke on any project. Here I'll give you an intro to a selection of these nodes as well as some tips, so you feel comfortable using them.

You don't have to use V-Ray for Nuke primarily for rendering. I've personally used the plug-in to enhance initial renders that I've been given. For instance, you can create your own fake fog, to give

V-Ray for Nuke nodes may feel familiar, allowing us to figure them out using logic and experience of standard Nuke nodes

you volumetrics in the places you need it. I've even added rim lights which I've then added over the render that I've been given. Being able to adapt the plug-in to the way I work has made it incredibly powerful.

As you use the plug-in more you'll want to understand how you can optimise your render times. The V-Ray Sample Rate AOV that we can get V-Ray for Nuke to kick out for us is incredibly useful when refining your render settings to get the render time down.

The AOV gives you a colour guide as to where your subdivisions are being used, so that you can decide if they are being used in the correct places and make decisions accordingly.

Ideally you don't want your AA (Antialiasing) being calculated on glossiness and shadows. In this article I'll also show you how to set this up.

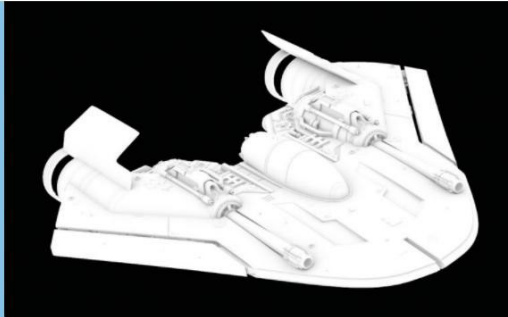
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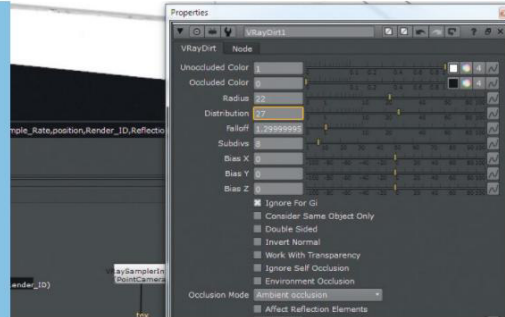
You don't have to use V-Ray for Nuke primarily for rendering, you can use it to enhance initial renders

PROCESS: ADVANCED WORKFLOW TIPS

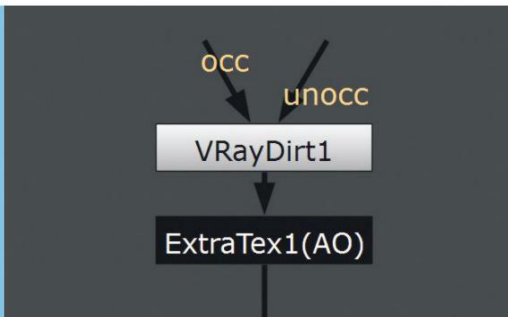
Josh Parks demonstrates some advanced techniques to try with V-Ray for Nuke

**ONE USE THE V-RAY DIRT NODE**

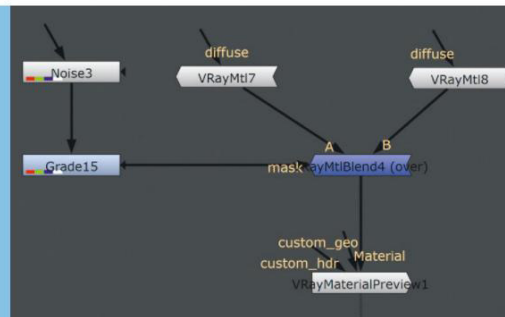
The VRayDirt node can be used in order to give you an Ambient Occlusion pass. Ambient Occlusion simulates the soft shadows that occur in the cracks and crevices of your 3D objects when indirect lighting is cast out. To do this press Tab and type VRayDirt. Press Enter.

**TWO ADJUST AMBIENT OCCLUSION**

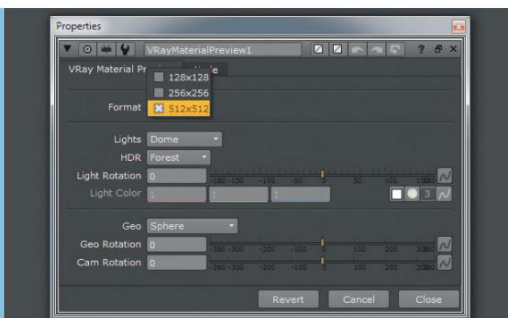
If you want to adjust your Ambient Occlusion, then dragging the Distribution slider on this node will increase how compact your area is, making the falloff less distributed over the model. I've known people who use this as a mask for moss or dirt.

**THREE CREATE A CHANNEL FOR YOUR INFORMATION**

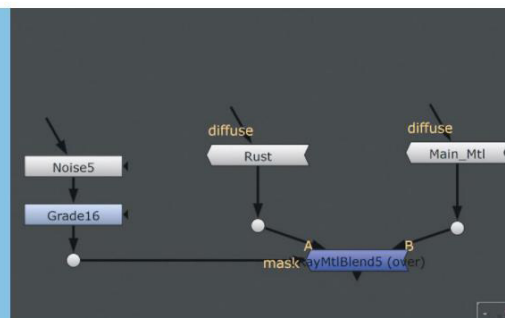
We now need to plug our VRayDirt node into a VRayRenderElement node set to ExtraTex in order to create a channel to hold our information. So press Tab and type VRayRenderElement to bring in the node and plug our VRayDirt node into this.

**FOUR USE THE V-RAY MATERIAL PREVIEW NODE**

The VRayMaterialPreview node allows you to apply your shader to a sphere. This can be lit by lights of your choice or you can plug a HDRI in. If you're going to use a HDRI to light your model, you should plug it into the VRayMaterialPreview Node to get an accurate look of how it will affect your material when applied to your model.

**FIVE OTHER TIPS WITH THE NODE**

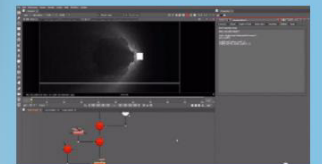
A few other useful things you can do in the node include adjusting the format in order to speed up your render times. I've found the most efficient way to do this is to get the looks of your material sorted at a low format, then when you think you're there, whack the format up and refine some more. This allows you to work as efficiently as possible.

**SIX USE THE V-RAY MTL BLEND NODE**

The VRayMtlBlend node lets you combine two materials, much like how a Merge node set to Over works with 2D elements. You also have access to a mask setting allowing you to mask off specific areas in order to reveal your bottom coat through the top. Your B pipe is the base and your A pipe is the coating.

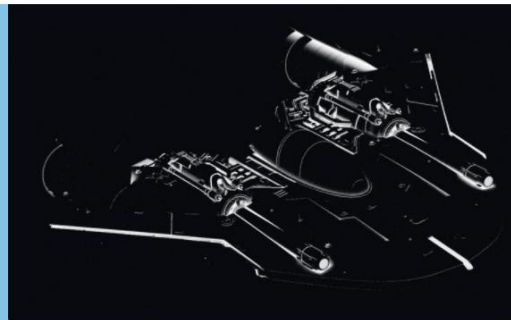
FURTHER TRAINING
V-Ray Environment Fog

Chaos Group have produced a great video which looks at V-Ray Environment Fog for basic volumetric rendering. You can view the video here:
www.bit.ly/208-vrayfornuke



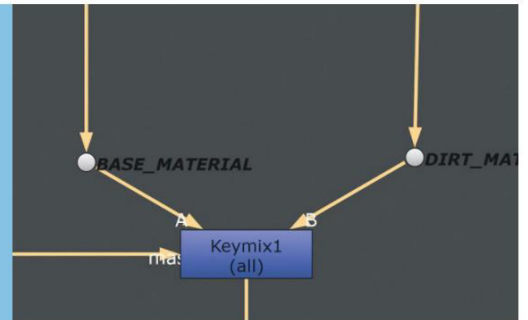
You also have access
to a mask setting
allowing you to mask
off specific areas

Since our Ambient Occlusion is just a mask for our edges, we can use this in other useful ways



SEVEN MASK YOUR V-RAY MTL BLEND WITH AO

Since our Ambient Occlusion is just a mask for our edges, we can use this in other useful ways. You may want to bring through the other material just in tight crevices, such as getting dirt in the areas you would expect to see it. We can do this by masking our Blended Material pass with our AO pass.



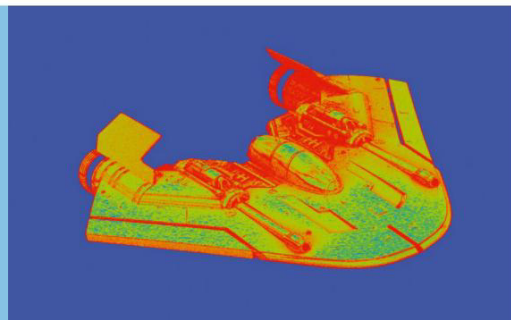
EIGHT CONFINE YOUR RUST MATERIAL

Shuffle out your AO pass into your alpha channel – we are going to use this as a mask for a Keymix. We now need to Keymix this pass with our main material. To do this, shuffle out both your materials and mask with your AO. We now have our rust material being confined only to our crevices.

FURTHER TRAINING

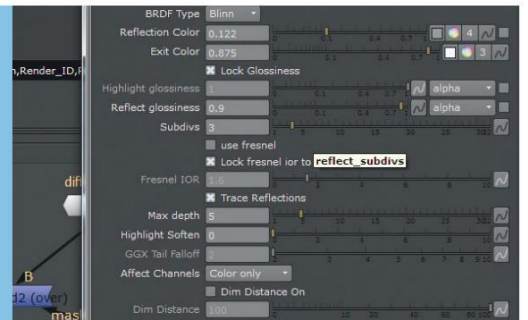
V-Ray render optimisation

If you want more information on how to optimise your V-Ray for Nuke renders then make sure you read this useful article by GC artist, Akin Bilgic: www.bit.ly/208-vray



NINE V-RAY SAMPLE RATE AOV

The VRaySampleRate AOV gives you a colour representation of what's being subdivided. Red represents your maximum sample per pixel setting in AA and blue represents your minimum sample per pixel. Ideally you want your maximum samples on your edges.



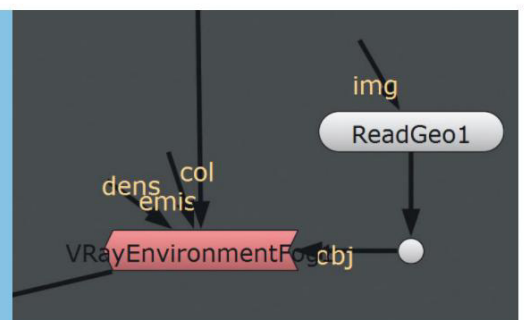
TEN EXPERIMENT WITH SUBDIVISIONS

You can often fix where your AA is being done where it shouldn't by experimenting with upping your subdivisions in your lights. As well as increasing your material subdivisions, you should look at each AOV and find which one is giving you the noise. Keep flicking between your VRaySampleRate pass and your other passes to see if the noise has improved.



ELEVEN V-RAY FOG NODE

I had a low poly version of the object so I could position it within the fog, then apply my fog layer to the initial render. Fog Density is a multiplier to the Fog Distance; the larger this distance number, the more transparent the fog. If you have a distance of 750 and density of 0.5 your actual value will be 375. In the spaceship composition I've used this node to give it the look of moving through the atmosphere.



TWELVE MANAGING THE FOG EFFECT

You can contain this fog effect within geometry by using a ReadGeo node to bring in an obj and plugging it into the obj input of your VRayEnvironmentFog node. Your fog effect will now be contained within this read in geometry. It takes a fair bit of nudging sliders in order to get the exact look you want, but it's something I've found I'm using more and more now I have access to it.

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Making flames with Fusion

Rob Redman shows how to create 3D fire effects and composite into your footage



AUTHOR PROFILE

Rob Redman

Rob is creative director at a boutique VFX and animation studio, working across print, film and TV. He presents at shows from FMX to Trojan Horse was a Unicorn, as well as teaching 3D. pariahstudios.co.uk

Fire, floods and destruction are some of the most common tasks given to VFX artists and in this tutorial I'm going to show you how you can quickly create a plume of 3D fire that is ready for compositing.

Fusion has so many tool options it can be tricky knowing where to start with any given effect, but in reality there is no proper answer. The beauty of this kind of application is that it frees the artist up to work in a way that suits them. So if you find a different method that you are more comfortable with then that's great.

The beauty of this type of application is that it frees the artist up to work in a way that suits them

The result I'm looking for here is one of a large smoky fire that can be saved as a preset to get me started whenever I need to burn something, and it should work as a base for interior and exterior scenes, so I won't light it for the preset; that should be saved for

THE KEY IS TO EXPERIMENT

Fusion is the kind of app that rewards experimentation, so I would advise you to hook things up in ways you might not expect, and just see what happens.

the actual compositing job. A fire effect can be made with just two nodes. In fact, you have to use a pEmitter and a pRender node or it won't work. That said, the effect will be a little too basic so we will add some more detail with a few extra nodes, just to help sell the effect.

I'll also show you how to emit from a texture as well as from the default geometry options that Fusion provides. This allows you to generate very specifically shaped fires, when needed.

FYI For all the assets you need go to creativebloq.com/vault/3dw208



Fusion has a multitude of tool options but there's no definitive way to work, which offers the artist flexibility

STEP-BY-STEP

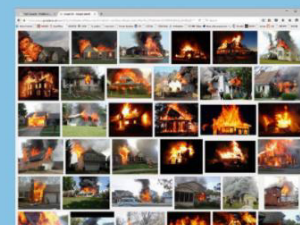
PROCESS: CREATE 3D FIRE EFFECTS

Rob Redman shows how to make a plume of 3D fire ready for compositing

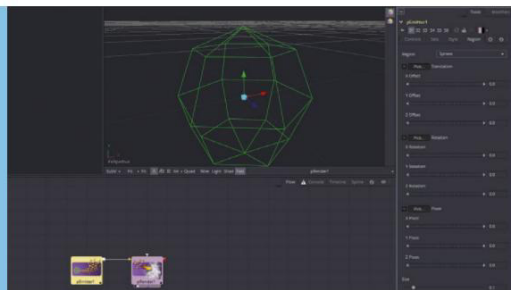
REFERENCES ARE KEY

Source plenty of references and polish up your Google-fu

Although the fire made in this tutorial doesn't look exactly like a specific type, it's that way on purpose; it's meant to be an adaptable starting point for further work. When you get to that point you really need to be watching as many videos, or filming fires yourself. Study not just the colour and shape but the motion too, as well as things like how different temperatures and sizes of fuel vary the motion of the flame and smoke. You'll notice that the more you look, the more things don't act in quite the way your imagination believes them to.

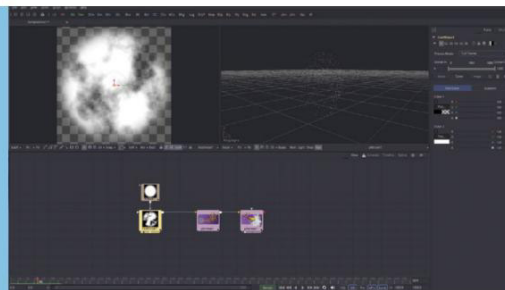


Google is your best friend when trying to create any digital content



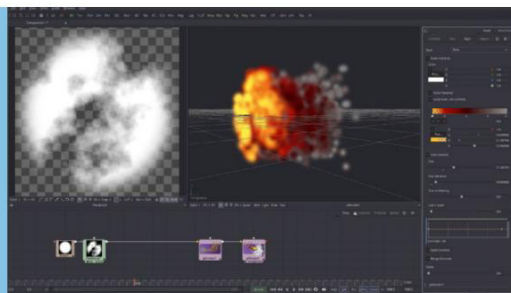
ONE PRE-REQUISITES

Fusion can't do anything with particles without two nodes, so add both a pEmitter and a pRender node. They can be found by the usual methods but as they're common tools they also have shortcut buttons on the menu bar, where they are labelled pEm and pRn. Once done, drag the pRender node into the right hand viewer window.



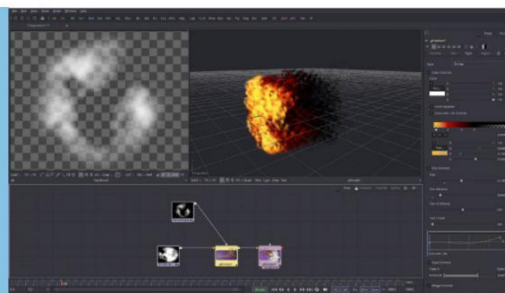
TWO DEPTH OF EMISSION

In the region section of the emitter, choose Bitmap as the Region type. An input will be added to the node, where you can hook up an image to drive the particles' spawn position. I added a Fast Noise node with a spherical mask, to soften the edges. The greyscale nature of Fast Noise makes it easy to work with.



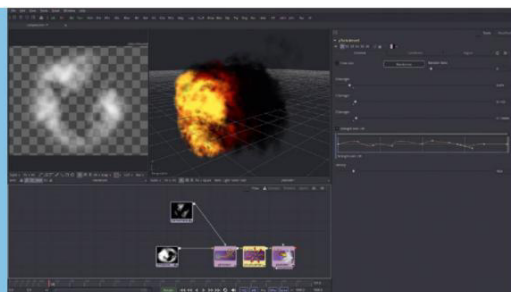
THREE INITIAL STYLING

Select the emitter and head to the Style tab. Here you can unfold the colour over life controls, and add a few knots of your chosen colour. I've gone for very obvious yellow/red/grey, but you can do anything you like for fire or electric energy particle beams, and so forth. I reduced the alpha of the yellow knot to add some brightness.



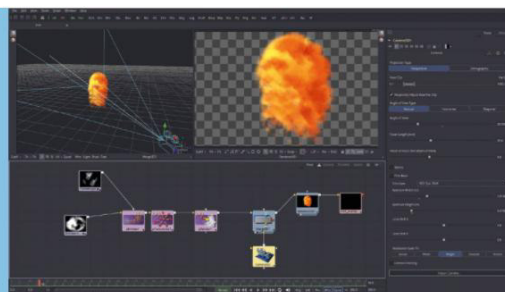
FOUR ADD FLAME DETAIL

For more realism and detail we can use another masked Fast Noise node, so add them to your workspace and in the emitter style change it to Bitmap and plug in the Fast Noise to the newly created input on the emitter – adjusting noise settings to taste. I also grouped and renamed the paired Fast Noises with their masks to help keep things tidy.



FIVE ANIMATION DETAIL

Fire moves in a very organic way and a great method of animating this is to add a pTurbulence node but rather than let it be constant, open the Strength over Life controls and click on the spline to add points, moving them and their handles to make a random strength profile, which will imitate gusts and eddies.



SIX PREP TO RENDER

Of course you'll want to render this out to see the finished result. To do so, I ungrouped my nodes then linked them up to a Merge3D, which was also connected to a Camera3D and then on to a Renderer3D, which output to a Saver node. I set the render and saver as 16:9 and render out as a simple quicktime.



HARDWARE REVIEW

HP Z840 and AMD FirePro W9100

PRICE £2,190 and £2,998.99 (respectively) | COMPANY HP and AMD | WEBSITE www.hp.co.uk, www.amd.co.uk



AUTHOR PROFILE

Cirstyn Bech-Yagher

Tired of always having to wait for others to fix things that broke, Cirstyn has fixed and built her own workstations for years, AMD as well as Nvidias.

www.twitter.com/cirstyn

Having become a staple in the high end business and graphics market, we took a look at HP's Z840 Workstation and the FirePro W9100 it came with, and put it through a week in a freelancer's life. Did it pass muster?

The first thing you notice about the workstation is how small it is, despite the power it packs under the hood. The second is how very silently it runs, until the GPU spins up. The Z840 comes with a dual set of E5 2.5GHz Xeon processors and 64GB DDR4 RAM, and OS of choice, which in our case was Windows 10. Despite its compact size, the chassis is actually a lot roomier than it looks, with plenty of space for additional drives, cards, and air circulation, even with a beast of a GPU like the FirePro inside.

Super speedy

After plugging it in and putting it online, I used it as my main workstation for a week, rather than putting it through yet another benchmark test. It was put through a typical 3D workflow instead: working with heavy poly 3D meshes, creating 4K texture sets and bakes in the Substance suite, to UV mapping a big mecha in Unfold 3D, in addition to Quixeling in Photoshop, and using the FirePro in Max, on V-Ray RT, V-Ray Advanced and Corona renders.

Everything went blindingly fast, most noticeably – and naturally – when working with heavy meshes and V-Ray. This isn't really a surprise, as the FirePro sports 16 GB GDDR5 memory with a 512 memory interface and 320GB/s memory bandwidth, but it was nice to work in V-Ray at the speed of minute intervals in the tweak-render-tweak cycle. That speed was also a very welcome experience as it tore its way through tweaking and auto-unfolding a poly-heavy robot in Unfold 3D – a task I'd been dreading on my lesser personal workstation. Baking sets of 4K

maps in Substance Designer took about five minutes on medium poly meshes – and never longer than 10-15 on the super heavy ones. It also goes without saying that anything requiring a framerate, from game engines like Lumberyard and Unreal to After Effects, ran and compiled super fast.

A few drawbacks

With the cost of workstations always on the decrease, would it be worth investing in something as big in this?

It depends on your needs. If you're planning on a gaming/rendering/modding hybrid, you might be better off building or buying a lesser workstation.

However, if you're working on a pipeline, or a purchaser for a team on a pipeline, this combo is definitely worth looking into, especially now it's matured in the market and any kinks have been ironed out.

It does, however, have a few drawbacks, provided you can afford the starting cost of £2,190 and £2,999 for the station and card respectively, the GPU's fan is a bit louder than what you typically hear on Radeon or GTX cards, but not disturbingly so.

In addition, despite fiercely competing with Nvidia's Quadro range, it is ironic that the FirePro W9100, which can perform better than the K6000 Quadro in shader benchmarks, is not supported by Allegorithmic's Substance suite yet. The suite worked well enough for me when reviewing Substance Painter 2 (page 96), in addition to finishing

It tore its way through
tweaking and auto-
unfolding a poly-heavy
robot in Unfold 3D

some client work, but if it started crashing, which it didn't do often, only a reboot helped. The hassle was highly mitigated by the system coming back up almost immediately, but it was still hassle.

So did it pass muster? Absolutely. The few issues I had were outweighed by the setup's speed and capabilities. Add to that ease of upgrade and you're buying something that'll last you a while.

VERDICT



Cirstyn advises this combo is definitely worth considering for those artists working on a pipeline

FAST AND MOSTLY QUIET

The AMD FirePro W9100 is built for ease and speed, even when supporting up to four screens. Put it into a workstation like an HP Z840, add some RAM, an SSD and new, shiny peripherals, like a UHD screen, and you've got a pro workhorse that's going to last you a while.



Even though the FirePro is not supported by Allegorithmic, a 4K workflow in the Substance series works fine, most of the time



IN PRACTICE: UNFOLD 3D AND V-RAY RAN REALLY SMOOTHLY

I often dread UV mapping as much as the next person, but I really appreciated how fast it could all be done on this setup. In addition, I've had some bad experiences with V-Ray and render times in the past, but once the GPU started, it was nice and fast – it shaved hours off a few production renders I had to do.



MAIN FEATURES

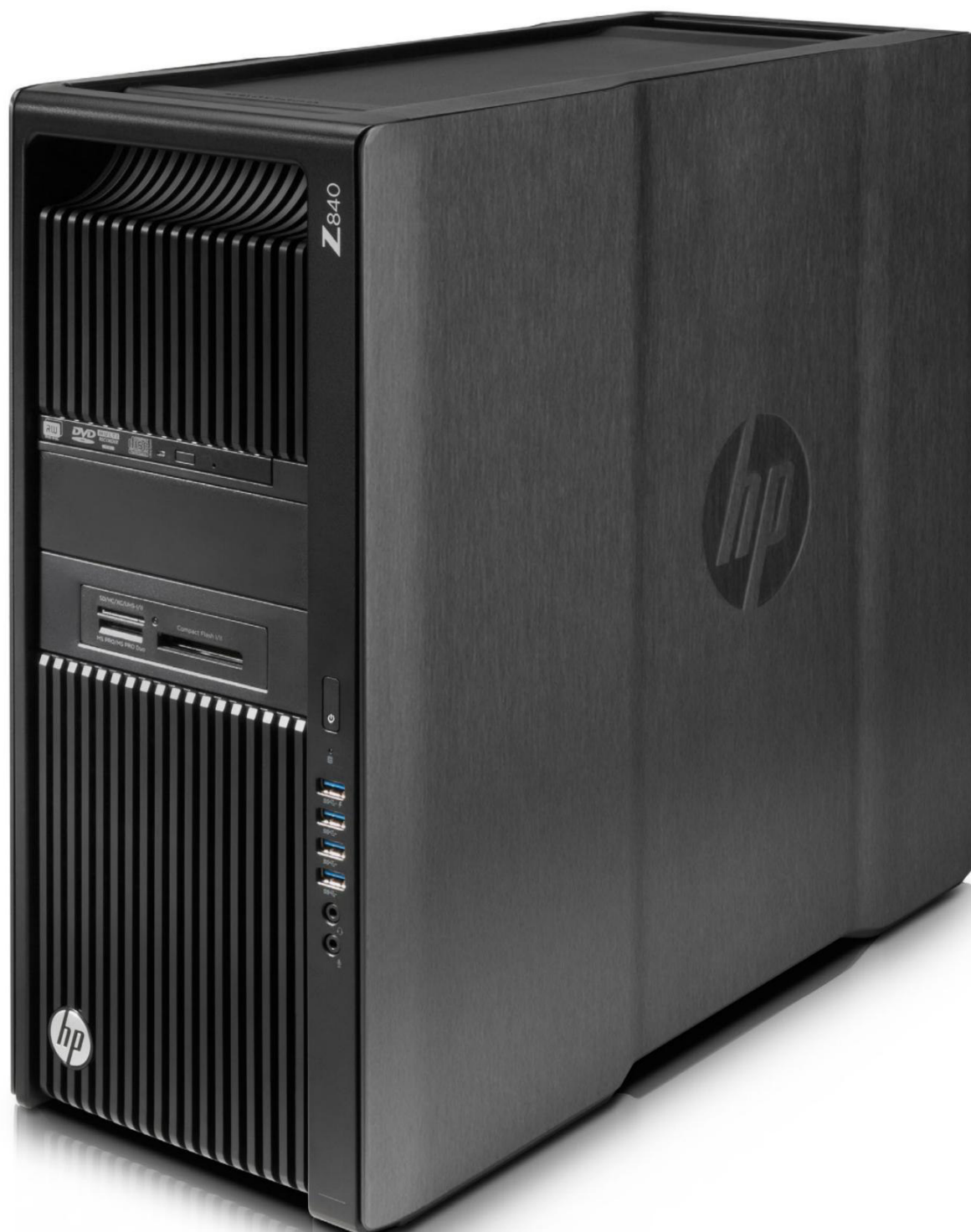
Intel Xeon
E5-2640
(2.5GHz, 15MB
cache, 6 cores)

64GB 2,133MHz
DDR4 ECC
Registered RAM
(2x8GB)

FirePro W9100
with 16GB GDDRS

Warranty: Three
years parts,
labour, and onsite
service limited
warranty

The workstation
is relatively
small, despite the
amount of power
under the hood





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Dell Precision M5510

PRICE £1,833.87 plus VAT | COMPANY Dell | WEBSITE www.dell.com/uk

MAIN FEATURES

2.8GHz Intel Xeon E3-1505M v5

16GB 2,133MHz DDR4 SDRAM

Nvidia Quadro M1000M graphics with 2GB GDDR5 memory

512GB Hynix SC210 M.2 SATA solid state disk

Warranty: 3 Years NBD

Dell has been producing notebooks specifically designed and configured for professional use for years. Most have been sizeable and chunky, but the M5510 weighs in at just a whisker over 2kg. This isn't excessive for a 15.6in notebook, and makes the M5510 within the bounds of possibility as an everyday portable.

Central to our M5510 sample is its Xeon E3 processor, although there are also Core i5 and i7 options as well. All are from the latest Intel Skylake generation, and in the case of the Xeon, the E3 provided is the 1505M v5. This runs at a nominal 2.8GHz, but there's a top Turbo mode of 3.7GHz, which should make it very good for modelling. It's also a quad-core processor, which Hyper-Threading turns into eight virtual cores, so it should be passable for rendering, as notebooks go.

Dell sent our M5510 with 16GB of 2,133MHz in two 8GB DIMMs, so it could take advantage of the processor's dual-channel memory ability. This should be enough for the kinds of applications this notebook will be running during its lifecycle. Although the processor sports reasonable Intel HD P530

Graphics on board, this won't be up to professional applications, so Nvidia Quadro M1000M mobile workstation graphics have been included as well (see Nvidia Maxwell Goes Mobile boxout), to provide some serious 3D acceleration, and there is no other option.

There are two screen options, however, with the base one being a 1,920 x 1,080 IPS panel. But for £189 you can have the UHD panel our sample came with – an iridium gallium zinc oxide touch display offering a resolution of 3,840 x 2,160. Detail is incredible, although perhaps a little excessive for a 15.6in screen, and Windows 7 looks a little silly at this resolution.

There are lots of storage configurations available with this model, with one M.2 PCIe slot and one 2.5in SATA bay, allowing up to two 1TB devices. Our sample was equipped with a decent 512MB Hynix SC210 M.2 SATA solid state disk, which offers quick reading and writing – but not as fast as the PCI Express SSDs which are also available as options.

There isn't a huge range of connectivity, but the notable

inclusion is Thunderbolt 3, which uses an identical connector to USB Type-C and can drive two 4K monitors at 60Hz with a throughput of 5GB/sec.

Performance is very good considering the chassis size. The result of 644 in the rendering portion of Maxon Cinebench R15 might be a little behind the Workstation Specialists WS-M150, but that had a desktop processor, and we haven't seen many faster mobile CPU-equipped workstations. The OpenGL result of 88.81 is again behind the WS-M150, but the latter had higher-end graphics. In SPECviewperf 12, highlights include 38.12 in catia-04, 31.84 in maya-04, and 55.86 in sw-03, all of which are commendable for a notebook. We also ran the Creative and Work portions of Futuremark's PC Mark 8 to test battery life, where the M5510 managed to last 105 minutes and 172 minutes respectively. However, our unit was supplied with the lesser 56Wh three-cell battery, and there's also a 81Wh six-cell option for £81.90 extra, which should give a very respectable 2-3 hours of creative work or 4-5 hours of less strenuous applications.

Overall, the Dell Precision M5510 is a decent balance of mobility and workstation power. It's not cheap at over £1,800 plus VAT for our specification, but it will fit the bill nicely if you need to take serious performance out on the road.

VERDICT



AUTHOR PROFILE

James Morris

James has been writing about technology for two decades, focusing on content creation hardware and software. He was editor of PC Pro magazine for five years.

www.tzero.co.uk

NVIDIA MAXWELL GOES MOBILE

Nvidia takes a little while to filter its latest GPU designs towards the professional markets, and even longer to offer mobile variants. The Quadro M1000M in this month's Precision M5510 is our first look at the mobile professional spin on Nvidia's Maxwell generation, which arrived for consumers over a year ago. The M1000M sports a decent 512 CUDA cores running at 540MHz and 2GB of 5000MHz GDDR5 memory on a 128-bit bus, offering 80GB/sec bandwidth. So it promises decent professional performance for 15 inch notebooks.

SOFTWARE REVIEW

Amberlight 2

PRICE \$59.99 (£42, €55) | COMPANY Escape Motions | WEBSITE www.escapemotions.com



AUTHOR PROFILE

Steve Jarratt

Steve has been into CG for many years. He's a regular contributor to 3D World and edited the magazine for two years.

bit.ly/steve-jarratt

When we reviewed the debut release of Amberlight, one thing we hoped to see in a future update was the ability to produce animated sequences – and now, along with a few other niceties, that's just what version 2 delivers.

If you're not familiar with the original, Amberlight draws streams of particles distorted by the 'magnetic' influence surrounding specific points, called fields. Up to a dozen of these fields interact to produce wonderfully complex imagery. It features a low-res real-time preview so as you move the fields around and alter their size, force, intensity and cut-off, you can quickly see how the patterns change. But the real beauty is in watching the image resolve, revealing more and more detail and often producing exquisite and unexpected results.

You have plenty of control over the look of the image and are able to change the colour palette – which is applied instantly without needing to re-render – as well as other factors, including contrast, tint and glow. The image can then be saved as a variety of image formats and with

The real beauty is in watching the image resolve, revealing more and more detail

transparency, so you can combine it with other elements in an image editor or compositor.

With this new release we were worried that the delicate nature of Amberlight's imagery might make it poorly suited for animation, but its output is rock solid with surprisingly little noise (and a de-noise filter will happily remove the remainder if need be). There's a definable raster-level playback for quickly previewing your animation, but the high-res (up to 4K) results are simply stunning; if you're doing motion graphics work, sci-fi scenes or abstract sequences, you'll easily find a way of integrating Amberlight 2 into your workflow.

This release also features Modifiers, split between Variations and Waves, each of which has a number of options. These are used

to control the behaviour of the fields and the way they influence the particles. They're a small addition to the UI, but have a massive effect on the end result, adding some much needed variety to the appearance of Amberlight's output.

As with the original, there are still a few features we'd like to see. Animation has a slight ease-in/ease-out built in, but there's no control over individual animation curves. Admittedly it's not a big deal and you could always retine in post if need be, but rudimentary curves would complete the animation function nicely. The new Modifiers aren't animatable either, which would surely be a useful addition for a future release.

These nitpicks aside, Amberlight 2 is a brilliant little app, ideal for swirling backdrops, cool reflections, or crazy displacement maps. Not only is it stupidly easy to create spectacular artwork, but it's also inspirational – if you can't think what to create then just hit the randomise button and let the results spark your imagination.

VERDICT



MAIN FEATURES

Renders complex streams of particles

Outputs animation up to 4K resolution

Low-res animation preview playback

New Modifiers to alter pattern shapes

Now features standard undo/redo



Amberlight 2 allows the user to change the colour palette, which is instantly applied but with no need to re-render

SHEDDING SOME LIGHT ON AMBERLIGHT

Amberlight started life as the experiment project, 'Fields', by developer Peter Blaskovic. The first version debuted at the end of 2013, when we suggested it would benefit from being animatable. It's taken two years but that functionality has finally arrived, making Amberlight 2 a great addition to anyone's creative armoury.

PhotoModeler Scanner 2016

PRICE \$2,495 | COMPANY Eos Systems Inc | WEBSITE www.photomodeler.com

MAIN FEATURES

SmartMatch

DSM

Automated coded targets

Manual marking and referencing

PhotoModeler has been around since 1993 when Eos Systems pioneered the development of the first commercial all-digital close-range photogrammetry and image-based modelling system. Having been through multiple iterations of the software, Eos have now released their most recent version, PhotoModeler Scanner 2016.

PhotoModeler gives you several different options for creating your point cloud/3D model. Each one has pros and cons but the preferred method depends heavily on your requirements and the type of thing you are scanning.

PhotoModeler doesn't just rely on automatic solutions which leave the user helpless if it doesn't work. They also provide manual tools that give you far more control over ensuring that the scanned objects create an accurate 3D model at

the end. Let's take a look at the different options and see how useful each one is.

Firstly, the automated tools are called SmartMatch and DSM (Dense Surface Modelling). These both match features across multiple overlapping photos and form a dense point cloud by result, which can then be triangulated/surfaced to form the shape.

These tools are automatic but are dependent on having a good quality overlap, as well as a sufficient number of distinct feature points. They recommend an overlap of 60 per cent with small angle changes from one photo to the next, but this can largely be trial and error.

Rest assured though that experience does make this process easier. One helpful tip is to think about what you're scanning. If the features are high density then go for the DSM, but if they're lower

density and spread across a bigger region, then you're best off using SmartMatch. These automated tools worked OK during testing but are obviously heavily dependent upon the angles the photos were taken at.

Secondly, there are automated coded targets which are more suited for objects that don't have distinct feature points. Placing on markers enables PhotoModeler to accurately match photos together and create an accurate 3D model.

Finally, it is possible to manually mark and reference features across multiple photos. This puts all of the control into the user's hands. If you've ever had a go at manually stitching panoramic photos then you'll understand how this process works.

Interface problems

The collection of tools works really well and provides frameworks for creating 3D models of a wide range of object types – no matter how small or large, or dense with features. In terms of usability I found the interface a

PhotoModeler doesn't just rely on automatic solutions which leave the user helpless if it doesn't work

bit unclear and clunky. I get that PhotoModeler want to give you all the tools you need but I think in the first instance it would have made sense to offer some really simple step-by-step processes for stitching and model creation. They have provided wizards but they're not particularly clear.

In conclusion, I would say that this piece of software is definitely worth exploring and persevering with the interface, if you want to get involved in creating models automatically from photos.

VERDICT

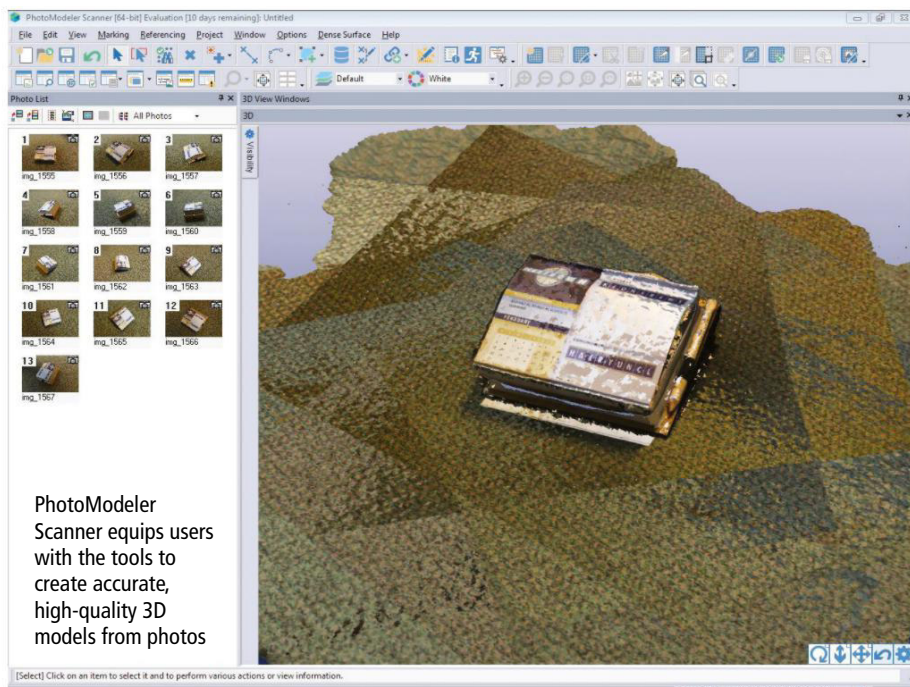


AUTHOR PROFILE

Paul Hatton

Paul leads a studio in England specialising in creating beautiful and interactive videos and environments. He has been working in the industry for over a decade.

www.cadesignservices.co.uk



PhotoModeler Scanner equips users with the tools to create accurate, high-quality 3D models from photos

THE HISTORY OF EOS SYSTEMS INC

For over 25 years Eos has been developing and marketing technology that combines photogrammetry with 3D modelling. This is an ever expanding industry and in recent years has got real traction in the arch-viz industry as an increasing number of visualisers are using it to create models of organic objects, like food.

SOFTWARE REVIEW

Substance Painter 2

PRICE Indie: \$149, Pro: \$590, Rent-to-own Substance Live Indie: \$19.90 monthly, Pro: \$64.90 monthly | COMPANY Allegorithmic | WEBSITE www.allegorithmic.com



AUTHOR PROFILE

Cirstyn Bech-Yagher
Cirstyn is a freelance CG artist and educator, with over a decade's experience in 3D, focusing on modelling and texturing.
www.twitter.com/cirstyn

Allegorithmic's flagship application Substance Painter 2 comes with new tools, like Clone and Smudge. In addition to many tweaks and fixes, it now also sports an Iray/Yebis hybrid, Lumberyard and Specular/Glossiness PBR workflow support.

Out of the box, Painter 2 feels smoother when using brushes and detailing – on tablet and mouse. This may be due to the release's listed improved viewport feedback when the engine is doing strong computations. In addition, there have been some additions to the toolbar, like the new Smudge and Clone features. These provide a non-destructive workflow and work roughly the same: create new layer, select and set the layer(s) you want to clone to, or smudge to pass through, and have at it.

The Smudge tool is pretty straight forward, but Painter's Clone tool isn't entirely like, for example, Photoshop's: cloned layers aren't rasterised, and any change you make on the source (layer) will also be applied on the cloned. This can be a small hassle if you want your cloned

layer(s) to be unique, but nothing an extra layer and tweaking won't fix.

In addition, Painter has been given some of Designer's functionality, namely an Iray/Yebis setup allowing the user to generate actual renders, in addition to the vanilla, non-shadowed OpenGL renders you see in your workspace.

Painter 2 feels smoother
when using brushes
and detailing – on
tablet and mouse

Allegorithmic have also put some rethought into Painter's shelves; the mask generators in particular. Here you'll find one of its best new features: the new Mask Editor and Smart Masks. Replacing the mask builder from earlier versions, Painter's mask-generating capabilities have now been put into one big, beefed up generator. This provides a lot more control than the earlier ones, and makes better use of

the baked maps from the Additional Maps slots. This allows vast flexibility in how and what you mask, down to Quixel-like control over the baked maps you've added. Combined with the ability to use materials as well as procedurals, you can create even more detailed masks for your textures. And as an added bonus, you can save and reuse the outputs of the generator as Smart Masks.

No release is perfect and Painter is no exception. The shelf could've benefitted from a setup like ZBrush's Lightbox, instead of giving it more content, no matter how nice. If you're on one of the new UHD screens, you may need to squint a little as font scaling hasn't been implemented yet. You may also run into an issue with the Iray/Yebis hybrid going into black and sometimes not remembering its settings. But the Painter team is very present in its forum and they fix their bugs fast.

These issues aside, it's a rock-solid release, and if you're looking for ease, speed and excellent output, this is worth checking out.

VERDICT



MAIN FEATURES

- Fast HQ texture creation
- New tools: Clone and Smudge
- New Mask Editor
- Smart Masks
- Iray/Yebis integration



The new Iray/Yebis hybrid renderer offers fast and easy renders for your newly painted object

AWARDS! AWARDS EVERYWHERE!

The Substance suite has, together with competitor Quixel, removed a lot of hassle and added ease and functionality to texturing. Recently awarded the label 'BpiFrance Excellence', Allegorithmic was chosen by Creative France to represent French innovation abroad. You can see Painter's output at work in games ranging from EA Sports to Rainbow Six Siege.

SOFTWARE REVIEW

MODO 902

PRICE £1,199 ex VAT/€1,459/\$1,799 | COMPANY The Foundry | WEBSITE www.thefoundry.co.uk

MAIN FEATURES

Camera Matching toolset

Camera projection textures easy to create

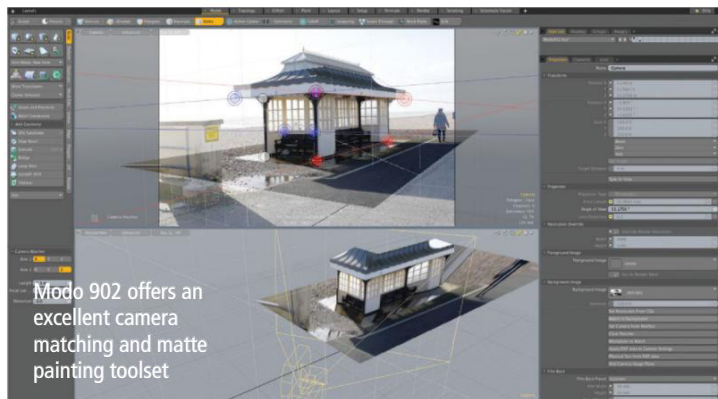
Projection shader allows a quick way of integrating objects into a scene

Images can be arranged in Z-Depth from the camera plane

Modo adds a new camera matching and matte painting workflow in the latest point release.

While not a unique feature, the native ability to match a Modo camera to that of a photographic still is hugely useful. It's straightforward to bring in a photo, set the scene to the dimensions within the photo – either manually or Modo will read the photo's EXIF data. Once the camera matching and scale indicators are lined up, the fun can begin.

Modo adds a new projection shader and texture; the Projection Shader is useful for simple setups, but the Projection Texture is hugely useful as it works with any material across any attribute, such as diffuse or luminous colour. Combined with the new projection painting options, it allows the creation of geometry, which is textured with the scene.



Coupled with Modo's great UV tools, we've used Modo 902 and Photoshop to create arch-viz clean plates in less than half the time and with better quality than is possible with Photoshop retouching alone. Modo 902 also allows the use of stacked images at separate depths, creating

a new way of placing your models within a photograph. Modo 902 is free for all 901 users and gives non users another reason to consider this ever improving application, which is catching up with the major players.

VERDICT



AUTHOR PROFILE

Mike Griggs
Polishing pixels since 1995, Mike is a UK based freelance 3D, VFX and mograph artist. He also works as a freelance technical writer.
creativebloke.com



TRAINING REVIEW

Octane Render for Maya

PRICE \$59 USD | COMPANY The Gnomon Workshop | WEBSITE www.thegnomonworkshop.com

MAIN FEATURES

Good value for money

A-to-Z walkthrough of using the Octane plug-in in Maya 2016

Easy to follow for beginners and existing users of Octane

Experienced lecturer

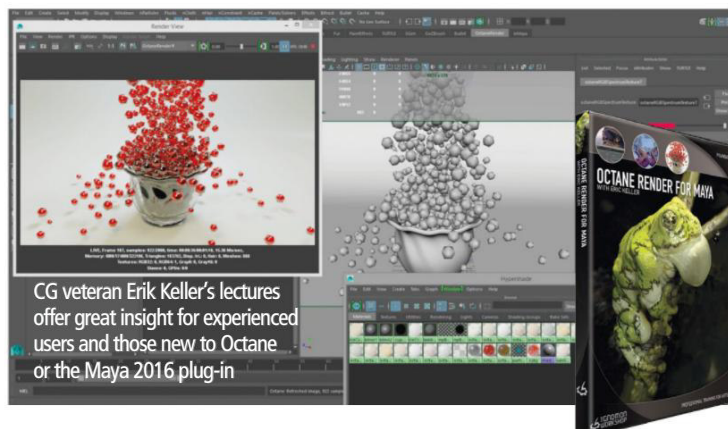
Good project files

Octane Otoy's unbiased GPU PBR renderer comes as a standalone or bundled version for most 3D applications – Maya included.

In his latest lecture series for Gnomon, CG veteran Erik Keller, shows you how Octane standalone works, before diving into the nitty gritty of the plug-in's render settings in Maya 2016.

He then moves on to Octane lighting, materials, texture maps, camera settings, hair and PaintFX shaders and particle systems, before finishing the set with batch-rendering tips

Erik's experienced ease with the tools and tutoring, makes this interesting and educational to watch, especially when he dives into details – things he's discovered and experienced, or how to avoid pitfalls, without making it too



CG veteran Erik Keller's lectures offer great insight for experienced users and those new to Octane or the Maya 2016 plug-in

boring on the finer technical details. In addition, the included project scenes are useful to rip apart whilst, or post, watching.

Whether you're new to Octane or the Maya 2016 plug-in and want to learn, or you're an experienced user looking to pick up tips, this set of

videos covers both. The only drawbacks are packaging issues. For example, videos could've been named coherently so experienced users could tailor viewing to their needs.

VERDICT



AUTHOR PROFILE

Cirstyn Bech-Yagher
Cirstyn is a freelance CG artist and educator, with over a decade's experience in 3D, focusing on modelling and texturing.
www.twitter.com/cirstyn



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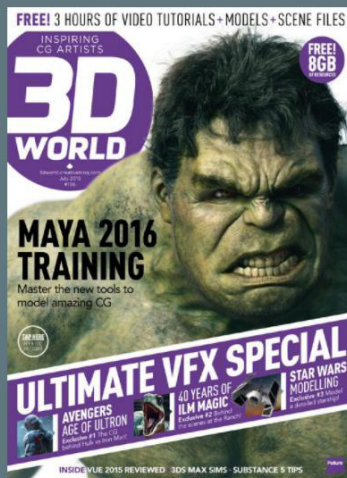
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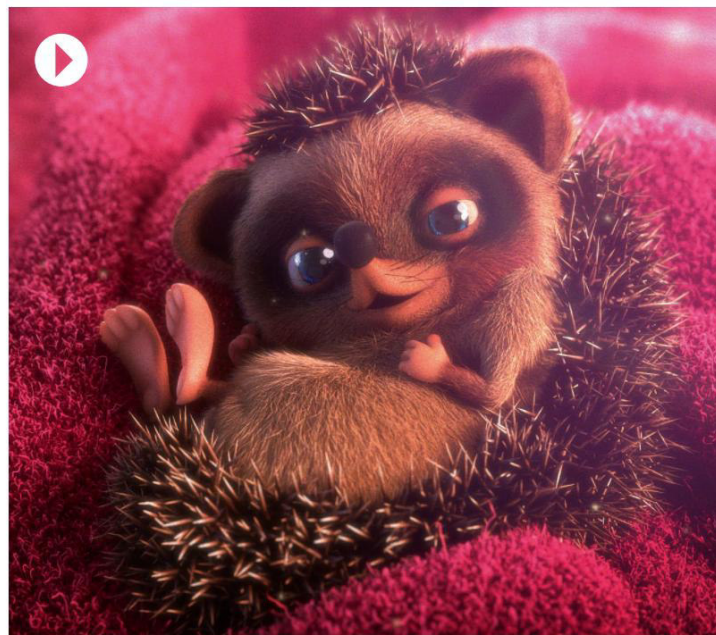
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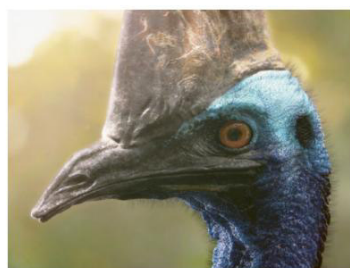
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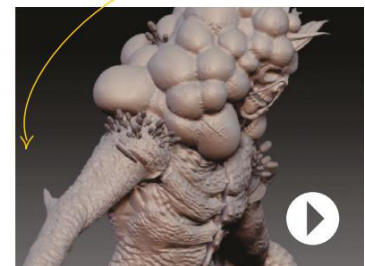
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