Apple Mac Pro review

2020’s Mac Pro is such a high-performance desktop workstation that we’ve teamed up with Sheffield-based to see how it measures up when used on projects from commercials and games to Hollywood feature films.

Apple launched the long-awaited Mac Pro back at its WWDC show in June last year, but it didn’t ship until December. The silvery aluminium slab marks a return for Apple to the highest end of desktop creativity – it’s a workstation aimed at video post-production, animation and VFX that’s several levels above where the previous ‘trashcan’ model was positioned, with a design that harks back to the blocky desktop that preceded that.

Conventional benchmarks won’t reveal enough about the true performance of a workstation like this, so for a real-world assessment of what the new Mac Pro is capable of, we reached out to one of the first creative companies in the UK to get its hands on a model – and use it on a high-end project for a client.

“Lunar Animation was founded in 2014 by three artists who collectively had 30 years of industry experience in animation,” says director James Rodgers. “The studio specialises in CG animation and we create content for a number of different sectors, from video game trailers to commercials, visual effects for feature films, attraction content for theme parks and recently an animated series.”

You can watch Lunar’s reel below.

[embedded content]

“Since we started the animation studio back in 2014, our entire pipeline has been based around the Mac. However, in recent years it’s been more challenging than we would have

liked. With fewer and fewer hardware updates and the limitations of the trashcan Mac Pro, things were certainly looking grim. We had many conversations about how we might eventually have to move over to use PCs.

“Fortunately in 2017, Apple announced the iMac Pro, which has been our main studio production machine for all artists. Now the new Mac Pro is here and we’ve been really excited to see how it’s going to evolve our studio.”

James says that Lunar has always been a Mac-based studio because of the platform’s reliability and the level of support, the quality of the displays and that the hardware retains it value over time.

“When we started the studio, we took the time to think about how we wanted our studio to allow artists to be able to do what they do best,” says James. “We tried to forget how most studios operate and how things have been done before and imagine a scenario where we create the best possible environment to make our best work. Ultimately we used our previous experience to make the best decision that was right for us and, I’ll be honest, is a decision that is not standard practice in the world of high end computer animation.

“Prior to starting the studio, myself and the other two company directors had worked elsewhere and endured using PCs and the hassle they brought with them. The constant blue screens of death, having to reboot at the start of your day to ensure the machine would function, and non-stop driver issues related to updates. We wanted to move away from being the technicians and focus on what we are here to do: create computer animation.

James also describes the aesthetic of those PCs as “an eyesore” – which is not fitting for the brand he wants to convey to his team or clients.

“As we are design led by nature, we wanted to ensure that the

space we created for our artists reflects the work they're trying to create," he says. "If any of our clients visit the studio they can be confident in our design ethic because it's not only what we create using a computer but the environment we surround ourselves in."

So from here we'll turn it over to James ands team to discuss their experience with the Mac Pro.

The Mac Pro 2020 meets *Jumanji*

As we specialise in computer animation, I thought I'd take the opportunity to list some of the software we use, which will give you a sense of the ways in which we've been testing the new machine: Autodesk Maya, V-Ray, Houdini, Nuke, DaVinci

Resolve, Photoshop and Adobe Substance Painter.

For reference in this article, the standard iMac Pro workstations our artists use are the following: 3.0GHz 10-core Intel Xeon W processor, 64GB 2666MHz DDR4 ECC memory, 1TB SSD, Radeon Pro Vega 64 with 16GB of HBM2 memory.

So the main thing we were looking for was upgradability, which the last Mac Pro didn't have and isn't something that's easily done on the iMac Pro– so as we continue to push the boundaries of what is possible we can add more RAM, better graphics cards without having to replace the entire machine. We were also looking for a new display as well which we got in the form of the Pro Display XDR.

New Mac Pro first impressions

In real life, the new Mac Pro is much more striking than we thought it would be, and you immediately notice the weight of the machine as soon as you try to lift it. Size wise, it's not as large as you might expect and can comfortably fit on the edge of a desk so that it doesn't have to sit on the floor. (We have robot hoovers in the office).

Mac Pro specs

The Mac Pro we received was a mid-tier model, which makes it great for testing: 3.2GHz 16-core Intel Xeon W processor, 192GB (6x32GB) of DDR4 ECC memory, two Radeon Pro Vega II with 32GB of HBM2 memory each, 4TB SSD storage and an Apple Afterburner card.

We also received the new Pro Display XDR along with the Pro Stand.

Dropping the Mac Pro into a real project

As soon as we got our new machine set up, we did the obvious tests which involved running Geekbench along with all the other hardware tests you can get your hands on (you can see these results at the end of this review). Once we'd done that, we looked at how we could use the machine for animation to test a bunch of different aspects and we had the perfect project.

The timing of receiving the machine couldn’t have been better as the studio was just about to begin work on the new Jumanji movie *Jumanji: The Next Level*. We were tasked by our client in LA to create the Main on Ends (MOE), essentially the end animated credits for the movie.

This was a fantastic project and opportunity for us as a studio and involved a number of challenging aspects you can expect from working on a feature.

The project had to be photorealistic and there were 28 unique panels for the credits, with each panel featuring at least one prop related to the movie. This was spread across a two-minute sequence.

The project would be done with a single camera move and there were also weather effects to create. All of this had to be done within a timeframe of four weeks. For anyone that’s wondering, four weeks is not a long time…

Not only is two minutes a long time, but 28 high-resolution photorealistic objects – each with a lot of high resolution textures and geometry – can start to cause issues. One of the immediate things we noticed as soon as we began the animation stage on an iMac Pro, is that we were struggling to get all of the assets into a scene with all of their high resolution texture maps without running out of graphics RAM.

One constant issue we would run into if working on the iMac Pro is this all too familiar error, illustrated in the video below.

Sure enough, we can clamp the resolution of the textures in the scene and the problem goes away. However this is fine for working with the scene, but because clamping the textures is

across the entire scene it meant that our 8K Jumanji map became a much lower resolution. This became more of an issue for us when sending the client updates to approve. The only other option would be to render the whole thing out, but we were sending updates daily, so this wasn't an option.

Then we moved onto the Mac Pro

With the texture issues we were encountering on the iMac Pro, we opened the same scene on the Mac Pro and all of the textures loaded up completely fine. This makes sense, as there is double the graphics memory for textures (32GB instead of 16GB). We were then surprised to see that it was playing back in real time without pre-caching, because even with clamped textures on the iMac Pro, we weren't getting a consistent 24fps during playback.

We then unlocked the 24fps cap on the playback and got speeds of up to 134fps. This allowed us to review, change and preview everything at lightning speed avoiding the need to create proxy textures and models, and we were able to work with the content directly.

We've captured this performance below. One thing to also note on this is that all of the content is being loaded over a network with the 10GB Ethernet that the Mac Pro comes with as standard.

Rendering on the Mac Pro

As we were working on the project, we were keen to look at the rendering potential. Now to put aside the aspect of GPU rendering, which we're keen to test on the machine as soon as RedShift running on Metal is released, we could only really look at the CPU potential.

Our standard iMacs are 10-core CPU machines and they're

incredibly fast, but the 16-core CPU in a Mac Pro will obviously run through the process faster. We've recorded a video here so you can see the difference, and so you don't get bored, we've sped it up:

So as expected, the Mac Pro is rendering the image in 70% of the time of the iMac Pro, clocking in at just over 26 minutes and the iMac pro coming in at nearly 37. It would have been really interesting to see how the 16-core Mac Pro would fair against the 18-core iMac Pro.

Simulating effects on the Mac Pro

The Jumanji project required a realistic steam simulation, and it was to be rendered and composited on top of the coffee up.

You can see how this appeared in the final result:

Again, we were keen to run this on the Mac Pro, as simulations need multiple iterations that involve running and adjusting them time and time again. The faster this can be done, the more quickly you can get the right settings and the final result.

The interesting thing here is that in a recent version of Houdini, you can now use the additional GPU as an accelerator for the simulation. We've run a test on an iMac Pro to demonstrate how much faster it was to use the Mac Pro for this part of the production.

How much can it do all at the same time?

As we were working on the Mac Pro, setting off simulations, editing and animating, one thing became clear. It is noticeably better at coping with running multiple applications at one time. So we took some of these applications and had them do the following:

- Maya: Play back the *Jumanji* animation scene at 24fps.
- V-Ray: Render an image from the movie in Maya.
- Houdini: Simulate steam
- DaVinci Resolve: Play back the full ProRes file of the end titles
- Photoshop: Save out a 2.4GB PSD file of the *Jumanji* map.

We wanted to capture this to demonstrate what it's like when working with all these applications running at the same time. It's important to note in this video that as we switch screens it appears as though it drops frames, but I can assure you it doesn't it and must be the screen flow software we used to record it. We've highlighted the frames-per-second on playback of the animation scene so you can see that's what we're getting.

The fact that it's possible to have a simulation running and a scene rendering while being able to review and edit animation, really shows the potential for a professional user. This capacity really blew us away.

The real game changer is the Pro Display XDR

When using the new Apple hardware to create the *Jumanji* project, the Mac Pro helped us to avoid a few technical

difficulties and do all aspects faster. But the new Pro Display XDR gave us an ability that we previously didn't have in the studio.

It provided us with a phenomenally accurate visual representation of the content we were making. The Pro Display XDR allowed us to switch into DCI-P3 colour space, which is a cinema-grade colour space for feature films. It enabled us to deliver something we were truly confident in – it essentially meant that we now had a reference monitor in the studio.

As a smaller studio without £30k to drop on a monitor, it's allowed us to see exactly what the final deliverable looked like as it was intended to go to the client. As our final deliverables were EXR files, we had the range to see past the maximum brightness of a standard iMac display.

Knowing that our final files were accurate saved us the cost of spending money to rent out a facility to check the files, which in all honesty we didn't have time to do because of the tight turnaround.

This is now an invaluable tool that we're going to be using on all projects moving forward.

Verdict

So we can safely say that the Mac Pro and Pro Display XDR levelled up (excuse the pun) what we could do within the timeframe we had on the *Jumanji* project. As a complicated single animation scene, we were able to watch the sequence in real-time with the full resolution assets and their textures. We could quickly make fixes and changes, and save out a play blast to showcase to the client (saving out at 139fps).

We could run our simulations and render out frames faster. To make this even better, we were able to do all these things at the same time and with the Pro Display XDR, we were able to

ensure that our final deliverables were an accurate representation of what we wanted to send to the client.

Next, as we wait for third party software to further integrate Metal and support the new hardware and recent operating system, we're going to test the character animation performance in Maya and how the machine will effect an animator's workflow.

https://www.digitalartsonline.co.uk/reviews/creative-hardware/apple-mac-pro-review/