The gap in quality between TV and film visual effects has narrowed and the technological resources are interchangeable, yet budgets remain worlds apart. Adrian Pennington reports on the UK's burgeoning TV VFX sector

Since 2000, the quality gap between television and feature film effects has shortened and the techniques and technology pipelines to produce them have become virtually indistinguishable. "We needed to develop tools to create 30 creatures a year for Primeval [at The Mill] in order to hit the TV schedule which meant devising really tight rigs, but that technology and experience is transposable back to features," says Cohen. "Deconstruction tools for TV are another element that easily crosses over."

The ambition with TV

The international success of these shows has helped ignite a wider creative renaissance in TV drama. A-list directors like Steven Soderbergh, Ridley Scott and David Fincher find the freedom to tell expansive stories outside the confines of Hollywood, while cable and internet giants like HBO, Showtime, Starz and Netflix — which has just signed four series from Disney's Marvel — have the appetite and deep pockets for subscriber-netting episodics.

The UK's VFX for TV industry remains tiny in comparison to the US which built a sizeable one on the back of shows like Smallville, but growth is promising in light of the recently introduced TV tax regime which gives producers a greater incentive to locate work here. Dneg, a beneficiary of Starz, made the decision to shoot the 16-hour sci-fi series Outlander in Glasgow, bagging the series' potential 2000 VFX shots. The facility also hopes to entice more work currently shot and posted in the US to its London or Singapore studios.

"We are interested in shows that shoot in the States but put their VFX into the UK," says Jonathan Privett, who heads Dneg TV. "That would be a real development for the sector."

The budget differentials remain vast. Privett estimates that for a major US TV series the VFX budget could be $2-3 million spread over 16 hours, whereas for a tenpenny 90-minute feature the figure is more like $30-100 million.

On the other hand, TV VFX work tends to be more predictable than the fickle nature of film projects which require massive scaling up one day and possible fanning the next. The collapse of LAI VFX stalwart Rhythm & Hues on completion of Life of Pi is testimony to that. According to Cohen, a film VFX house may ramp up its staff and pipelines to create hundreds of shots only to have the show's editorial slash its requirements. In TV though, the facility faces multiple but regular transmission deadlines ensuring a core spine of work to sustain the business.

"The ambition with TV will always match that of a feature but the challenges are time and budget," says Cohen, who formed Milk last April with fellow members of The Mill's defunct TV division. "The time between series deadlines are very condensed and you have to stick with what you come up with first. On film, you might have the luxury of creating a hundred iterations of an object. In contrast, on TV you have to go with version seven." This demands an economy of storytelling he says, where a facility must find a way to communicate multiple plot points in short sequences. "TV is a slightly more forgiving medium," he adds. "There is lots of stuff you can get away with on a TV screen that you couldn't if the shot were blown up to a 90ft screen. That is a huge difference."

Privett, who left Rushes with VFX producer Louise Hussey to help set up Dneg TV also in April, agrees: "If you're doing a green screen shot for example, then the gold standard is 100% perfection but if a tiny bit of detail is lost somewhere then on TV you probably wouldn't worry about it, whereas on film you would go the extra mile. That is the compromise you make when your budget is a hundredth of what it would be for a feature."

Add Hussey: "In TV, you don't have six months of creatures work, you might have four weeks. Instead of several months of heavy effects design, you might only have time for a quick, simple effect."

A collaborative approach

Artists, however, enjoy a more direct relationship with the lead creatives on a TV job: Instead of dealing with layers of VFX supervisors and decision by committee, working hands on with the TV director, facilities can obtain approvals faster and the whole experience feels more collaborative. "There's not as much prep time, not as much time to complete the shot and you have to think about your approaches much more carefully," says VFX supervisor Hayden Jones. "Not only do you need to create the effect to deadline but when a client wants an alteration you need to make those changes quickly."
A decade ago VFX for TV formed a cottage industry in relation to feature film effects, but now TV commissioners can base entire shows around CGI characters and environments. The hardest thing to create is something that's not been seen before," he says. "It's a process of trial and error until we come up with a look that the director likes and it fits into the storyboard." 

**Doctor Who's high-profile 50th**

Milk has completed shots for the third series of *Sherlock*, creature animation for David Attenborough's *Natural History Museum Alive* in 4K 3D for Sky Atlantic, and is in pre-production on BBC/Space's *Jonathan Strange and Mr Norrell*. It is also working on the feature *Hercules*. The facility is synonymous though with *Doctor Who*, having worked on all seven series since 2004 and just landed series eight with a possible two more to follow.

"The 128 shots in 3D for the 75-minute special *Doctor Who* 50th anniversary episode: The Day of the Doctor was the team's first chance to stereo treat a TV drama. "Because we are dealing with four times the amount of data, the time spent compositing and rendering is longer and the cost was probably double the normal spend," explains Cohen. "We updated CG models or created new assets of the TARDIS, Daleks and spacecraft and matte-painted plates were reworked with a stereo depth." Milk's creations included a CG fly-through of the besieged Gallifreyan city Arcadia and a framed painting that appears to be a two dimensional object but which, when the camera moves around it, is revealed to be a full 3D environment with depth. Milk also created flying fighter machines Dalek Peda, following initial design by the BBC's art department. Milk refined and animated the model in Maya, textured in Mari and rendered it with Arnold before marrying it in the CG environment, itself a mix of traditional matte painting and 3D geometry.

"A lot of the tricks you can get away with in 2D you can no longer do in 3D," says Cohen. "Instead of 2D matte painting you are exploring the geometry of the scene and lighting it in 3D which is more complicated, technically demanding and more time consuming in terms of set up and rendering, and it requires more crew."

"You recast elements in 2D so you can tell how large an object is. In 3D, though, extreme rescaling doesn't work so that is one example of a technique that is removed from your box of tricks. 2D elements will often not work in stereo as they have no depth."

Murray Barber, VFX supervisor, was tasked with developing a tornado effect which could be controlled easily shot to shot. "The

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