

SMOKE, MIRRORS AND THE REAL MAGIC OF MOTION CAPTURE IN SPACE JAM 2

“
Any sufficiently
advanced technology
is indistinguishable
from magic.”

Arthur C. Clarke,
‘Profiles of The Future’, 1961
(Clarke’s third law)

HOUSE OF MOVES DISCUSSES
THE PROBLEM OF TRACKING
THAT LOOKS ‘TOO EASY’

House of Moves has become renowned in the VFX and games sectors for its deep focus on quality, resulting in a client list that includes the likes of Marvel Studios, Industrial Light & Magic and Rockstar Games. The quality of their output, however, can sometimes belie the complexity of the work they do.

That complexity presented challenge after challenge on the set of **Space Jam: A New Legacy**, which puts stars including **LeBron James** and **Don Cheadle** on a basketball court alongside the likes of Bugs Bunny, Daffy Duck and Marvin the Martian.



VICON

“We set up a system around a professional-size court,” says Jimmy Corvan, Business Development Manager at House of Moves. A professional court is 94 x 50 feet and it took 96 Vicon T-Series cameras to cover it, but the setup was relatively straightforward despite the volume’s size. It was a series of additional hurdles that made the project technically difficult.



Jimmy Corvan, Business Development Manager at House of Moves

“We shot for 47 days on the lot at Warner Brothers. It was a serious challenge because, like many movies, motion capture was a late consideration in planning and we needed to adjust to decisions and requirements that were already in place.”

The variables stacked up. “The first week of shooting, the director shot with a fog machine in an enclosed stage. This entire stage was wrapped in green. It was like a giant, light-bending, green cocoon that was filled with fog,” says Corvan.

And beneath the fog was another motion capture issue. “The floor was super shiny, every single day,” Corvan says. “They wax it every single day, which was like shooting into a giant mirror...”

The biggest challenge, however, came in the form of Don Cheadle’s wardrobe. His character, Al-G Rhythm, wears what Corvan refers to as a reflective suit. “And by a reflective suit,” he goes on, “I mean it’s like a disco ball in suit form. And they needed us to track markers on the upper body.”



POWERFUL TECHNOLOGY ENABLES CREATIVE SOLUTIONS

For House of Moves to be able to problem-solve in such dynamic circumstances, the studio needs technology that’s equal to its abilities. “With Vicon,” Corvan says, “we know exactly what we’re getting. And what we’re getting is the highest quality available on the market. The T160 or V16s are just the best practical motion capture cameras on the planet.

“Quite frankly, when we shoot with 4 mm markers on the face, fingers or even skateboard wheels, we get a higher resolution than an HD camera because we get 16 megapixels on those T-Series. On the post side, how many people only buy Blade or Shōgun after owning non-Vicon hardware? The answer is ‘a lot’. I’ll tell you that from hearing how many people want to solve in Shōgun, because the software is vastly superior to whatever else is out there. However, I simply don’t know why you wouldn’t pair Shōgun with Vicon cameras. When we were able to deploy the real-time subject calibrator, we were able to regain 7–12 minutes per actor every morning. When studios are paying millions per day in talent and overhead, regaining 7–12 minutes per actor is... I literally can’t think of a word to describe how huge this is.”

KEEPING HUMANS IN THE LOOP

While House of Moves relies on the power and accuracy of its Vicon setup, however, the studio’s process is still grounded in its human talent.

At many motion capture studios, software such as Shōgun can do the heavy lifting and the resulting data will meet a client’s needs, says Corvan. “That’s definitely good enough for a lot of people. Shōgun is getting better and better at figuring this stuff out, even in real time.”



However, that’s not how House of Moves operates. “We have consistently had animators who are working on the data on the back end,” Corvan says.

“What we’re delivering back to our clients is data that animators actually want to receive, because animators are the ones who are working on that data [at House of Moves]. It’s not ‘we’ve got a bunch of data, we’ll put it into a system, spit it out, and you get what you get and your animators can fix what they need fixing’. A human touches every portion of it, a human cleans it, a human solves it and a human retargets it.”

It could be argued, in other words, that when House of Moves is asked ‘can’t you just...?’, the studio is a victim of its own success.

THE KNOWLEDGE GAP

As Corvan sees it, challenges like the Space Jam court, which face many teams doing capture for the entertainment industry, are the product of a knowledge gap.

“The phrase ‘can’t you just...?’ comes up a lot,” says Corvan.

“Like, ‘can’t you just do this thing? It’s just as easy’. Motion capture is regularly looked at as: you press a button then Tom Holland crawls around on all fours and Spider-Man pops out the back end. And that’s not the way it works.”

While most people know what motion capture is, they don’t necessarily know how it works. “These cameras don’t see things like traditional cameras. We aren’t analyzing pictures, we’re analyzing pixels.

“And if light gets distorted because it’s being bounced around by fog, then we don’t know what’s a real marker and what’s not. We’re not looking through the eye of the camera: we’re looking through the algorithm that is telling us what the camera is saying about where these markers are. I think that, more than anything, it’s because they believe motion capture has gotten so easy, we don’t have any special technical needs.”

A PROCESS THAT WORKS

Thanks to the combination of Vicon technology and the talent that House of Moves has in operating it, the studio will retain its reputation for technical wizardry a while longer. The Space Jam shoot, for all its technical hurdles, proved a success.

“I keep going back to that suit, because it’s so ingrained in my memory. I thought, ‘There’s no way this is going to work’. But we put markers across the top of Don Cheadle to track him. And we actually tracked him! The data is insane. There are three markers that are stable the entire time. And the rest is just flashing lights all over.

“It was a sight to behold, but those three little markers were enough. It was just one of those moments where I was so certain of something and so thrilled to be wrong.”