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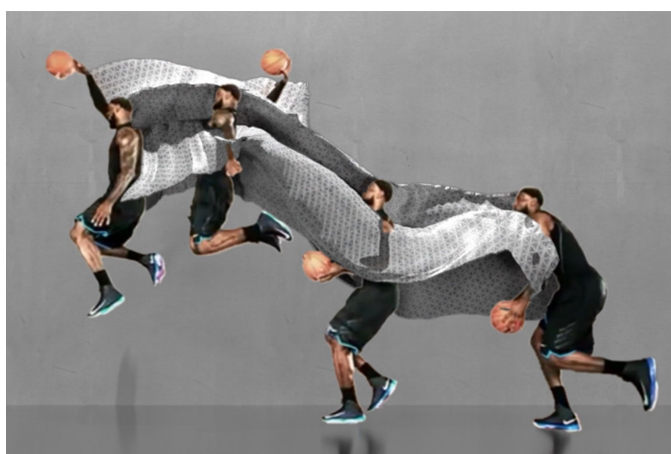
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Wormlike motion sculptures show how athletes move in 3D



Dyllan Furness, Digital Trends • September 20, 2018



Researchers at MIT have developed a system that offers athletes a unique way to visualize their bodies in motion. An algorithm scans 2D videos of a person in motion, and generates data points that can be 3D-printed into [More](#)

Dynamic 3D-printed “motion sculptures” created by researchers at the Massachusetts Institute of Technology (MIT) offer athletes a unique way to visualize their bodies in motion. The system they’ve developed uses an algorithm that scans 2D videos of a person in motion, identifies key points on their body (for example, hip, knees, and ankles), and generates data points that reflect their movement through space. The data can then

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The system, which they've dubbed **moscup**, could be used to provide athletes with an all-angle view of their athletic movements, from swinging a tennis racket to throwing a football or shooting a jump shot. By viewing their movement from different viewpoints, the athletes could get a perspective that wouldn't otherwise be accessible in normal video.

Take, for example, the Golden State Warriors' three-point shooter extraordinaire, Stephen Curry. It's hard to imagine that **Curry could improve his jump shot**. But perhaps with a 360-degree point of view, he and his coaches could identify an area for improvement.

"Motion sculptures are 3D structures, so Curry could explore his move from any angle he likes, even if there wasn't a camera from that angle when he performed that move," Xiuming Zhang, a doctoral student at MIT's Computer Science and Artificial Intelligence Laboratory who worked on the project, told Digital Trends.

"Another nice feature of motion sculptures is that they capture the interaction between space and time. For example, Curry is able to read out, from motion sculptures, that his left arm penetrates a plane formed by his right arm moments ago. So there's a space-time interaction here, which is really hard to make sense of even by repeatedly playing the original video."

Zhang added that Curry could create a motion sculpture of him performing a slam-dunk, plus one of another ball player such as Kobe Bryant, then compare the two motions in 3D. "This sculpture comparison may reveal differences in their 3D arm motion, which are indistinguishable from 2D videos," he said. "On a related note, in sports, motion sculpture could potentially function as a form of souvenir. For instance, a decisive shot in the World Cup final could be 3D printed and sold as a souvenir in the arena right after the game."

In the future, Zhang said he and his team expand their system to highlight interactions between people, such as body language changes, that could be analyzed by social scientists. The researchers will present their project next months at a conference in Berlin.

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