

## The President, in 3D

PAUL DEBEVEC [USC Institute for Creative Technologies]: We're here at the White House, working with the Smithsonian Institution on creating a 3D presidential portrait. And the system that we've brought to be part of this process is called our mobile light stage.

It's right over there and we're setting it up right now so that it can be used to record almost certainly the highest resolution digital model that's ever been made of a Head of State.

GUNTER WAIBEL [Director, Smithsonian Digitization Program Office] : The inspiration for the project of creating the portrait of President Obama really comes from the Lincoln life mask in our National Portrait Gallery and I have a Lincoln life mask with me today.

And they're called life masks because these were directly taken from his likeness so there was plaster put on his face. There were two little holes poked where the nostrils were so he could still breathe and seeing that made us think, what would happen if we could actually do that with a sitting president? Using modern day technologies and tools to create a similarly authentic experience that connects us to history, to connect us to a moment in time, and connects us to a person's likeness.

PAUL DEBEVEC: So the process should go relatively quickly.

We will invite the President to sit down. He will be surrounded by 50 custom built LED lights, eight high resolution sports photography cameras, and an additional six wider angle cameras. In about one second, as he holds his presidential pose, he'll be illuminated by ten different lighting conditions which will change the polarization of the light, the directionality of the light, and will give us everything that we need to understand the shape of his face and how it transforms into illumination into the images that we see of him.

Ten years ago it was barely possible to think this could be done.

VINCE ROSSI [3D Digitization Program Officer at the Smithsonian]: So here we have a structured light 3D camera that we use to scan the President. For handheld they're flashing a fringe pattern of light and there are stereo cameras recording how that fringe pattern forms over geometry or in this case the President's face.

TOM KALIL [White House Office of Science and Technology Policy]: The President getting his likeness scanned, as cool as that is, it is also about a broader trend that's going on; and that is the third Industrial Revolution. It's the combination of the digital world and the physical world that is allowing students and entrepreneurs to be able to go from idea to prototype in the blink of an eye.

VINCE ROSSI: It's been a few days since we've 3D scanned the President. And we're looking at some raw data on the screen right here so this is the data that came out of the handheld scanners that Adam Metallo and I were using to scanned the President.

ADAM METALLO [3D Digitization Program Officer at the Smithsonian]: Well this is the first bust that's created of a Head of State from objective 3D scanned data so this is an artistic likeness of the President. This is actually millions upon millions of measurements that create a 3D likeness of the President that we can now print and make something that's never been done before.