

## 3D Printing Advances Cerebral Aneurysm Research

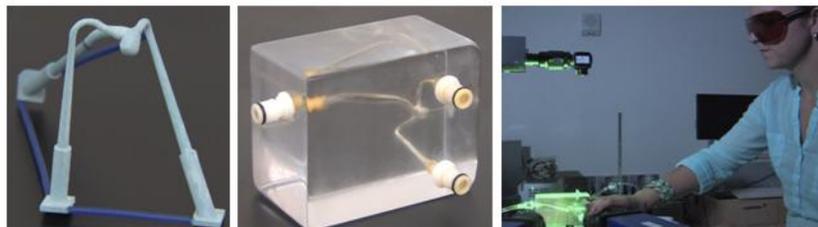
*“We are all going to be surprised by the incredible number of places that 3D printing fits into both medicine and medically-oriented research.”*

- Dr David H. Frakes, Principal Investigator – Image Processing Applications Laboratory, Arizona State University



*The numbers are stark: Cerebral aneurysms affect 1 in 50 people and contribute to nearly 20,000 deaths in the USA alone every year. If an aneurysmal sac ruptures in the brain it becomes a highly lethal condition with a 50% mortality rate per rupture.*

Arizona State University hosts one of the leading programs in cerebral aneurysm research with funding provided in part by the Mayo Clinic and National Science Foundation, among others. ASU’s research findings are directly applied at participating hospital partners and in the design of improved endovascular medical devices .



**Wax Model**

**Polyurethane Mold**

**Fluid Dynamics Testing**

“The SolidScape machine is the heart, backbone of our process. We use that to build the core blood vessel models that we then translate into transparent flow models for our experiments,” according to Dr. David Frakes.

“The end product of our physical 3D modeling stage is a transparent block wherein there is a lost-core or a hollow portion of the model that is an exact replica of a cerebral aneurysm from a person. Rapid prototyping is how we get that first positive, before we get the negative, which is the flow model,” explains Dr. Frakes.

“All of the ground-truth data that is informing our simulations in the end, it comes from these models that the SolidScape machine helps us build.”

### Customer Profile

The Image Processing Applications Laboratory (IPALab) at Arizona State University addresses current and important image processing problems in a variety of different fields. Ongoing research at IPALab includes projects that are biomedical, industrial, and military in nature. The ultimate goal is to improve human quality of life through the development and use of advanced image processing.

[www.ipalab.fulton.asu.edu](http://www.ipalab.fulton.asu.edu)

### SolidScape System Specifications

**Printer:** R66®PLUS

**Software:** ModelWorks®

**Materials:**

- plusCAST™ - Build
- Indura®Fill - Support