



HS/HSL

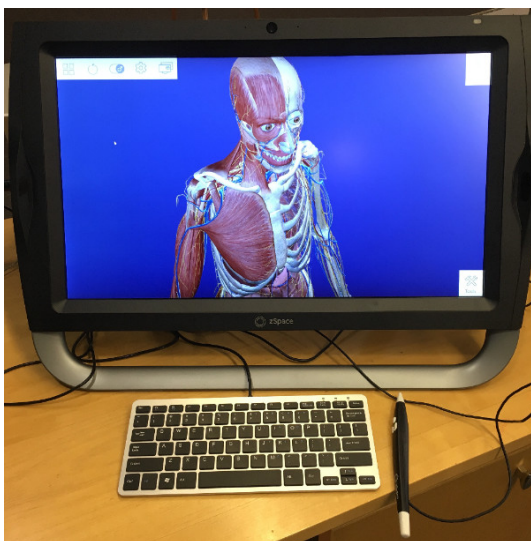
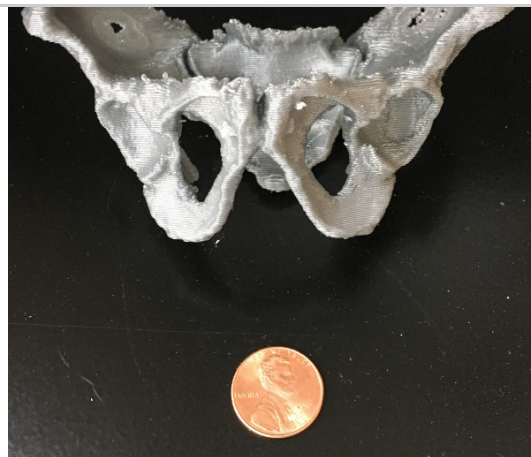
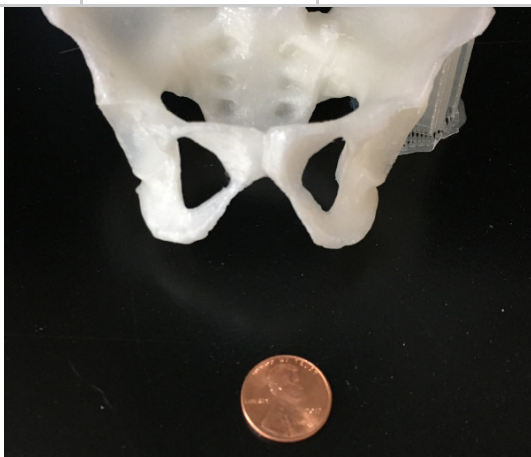
innovation space

Newsletter

The graphic features a background of interlocking gears. Some gears contain icons: a lightbulb, a person with arms raised, a brain, a power button, a network diagram, and a DNA helix. Other gears contain the words 'collaborate', 'create', 'make', and 'design'. The text 'HS/HSL' is in red at the top left, 'innovation space' is in large red letters in the center, and 'Newsletter' is in red at the bottom right. A red and grey wavy banner is at the bottom.

Maker:	Adam Puche
Affiliation:	<u>Department of Anatomy and Neurobiology, University of Maryland, Baltimore School of Medicine</u>
Project:	3D printing and visualizing human anatomy for medical education
Used:	<u>Afinia H480</u> , <u>Lulzbot Taz5</u> , <u>zSpace virtual reality station</u>

According to Dr. Puche, 3D printing provides new opportunities for learning anatomy outside the classroom. "Studying anatomy at home has mostly been limited to flat images in books or on computer screens," due to bulky physical objects that can be awkward to transport, and the cost and availability of materials. However, some regions of anatomy are best understood through hands-on interaction rather than looking at passive images.

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Clockwise from the top left: female pelvis print, male pelvis print, femur print, zSpace virtual reality workstation with the Visible Body application open.

The pelvis, Dr. Puche notes, is one such area that is particularly difficult for students to understand, with its many dozens of different muscles, nerves, arteries, and veins that connect to it or traverse through it. Which is why models of a male and female pelvis bone, and a femur bone (which connects to the pelvis), were selected for this pilot. "It's important for students to physically examine and interact with this complex anatomy to really understand how it works. The accessibility of 3D printers begs the question, can we provide students with hands-on models that they can have and study with in any location?"

The miniaturized bone models Dr. Puche's students will print will be at a scale of around about 40% of their actual size, and will cost between \$3-\$6 each.

Dr. Adam Puche received his PhD from the

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understanding how the olfactory system develops during embryogenesis, early postnatal life, and functions in adulthood.

Emerging Tech in the News and Literature

1. [3D Scanning Using a Dip Scanner](#) (sdu.edu.cn)
2. [FDA Clears 3D Printed Titanium Medical Implant for Use](#) (3dprintingindustry.com)
3. [Creating Three-dimensional Printed Models of Acetabular Fractures for Use as Educational Tools](#) (rsna.org)

Did You Know?

You can now visualize and explore human anatomy and DICOM (Digital Imaging and Communications in Medicine) files in 3D using our [zSpace VR \(virtual reality\) station and software](#). The zSpace VR station is located at the HS/HSL Innovation Space and available for use on a first-come first-served basis.

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Upcoming HS/HSL Innovation Space Workshops

Introduction to 3D Printing

- August 15, 2017

Introduction to 3D Modeling

- August 29, 2017

From CT to .STL: Create a Printable 3D Model from CT Scan Data

- August 23, 2017

[Register for our free workshops](#)

New to the HS/HSL Innovation Space?

The Innovation Space is designed for innovative and collaborative hands-on learning experiences. It offers three [3D printers](#), two [3D scanners](#), a [Mac Pro](#) with specialized multimedia software, a plotter for [poster printing](#), a [zSpace](#) virtual reality station, [Google Cardboard](#) viewers, a large DNA model, two molecule kits, a button maker,

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For more information, visit our webpage at
<http://www.hshsl.umaryland.edu/services/inspace/>.



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