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HS/HSL

innovation space

Newsletter

Issue number 28

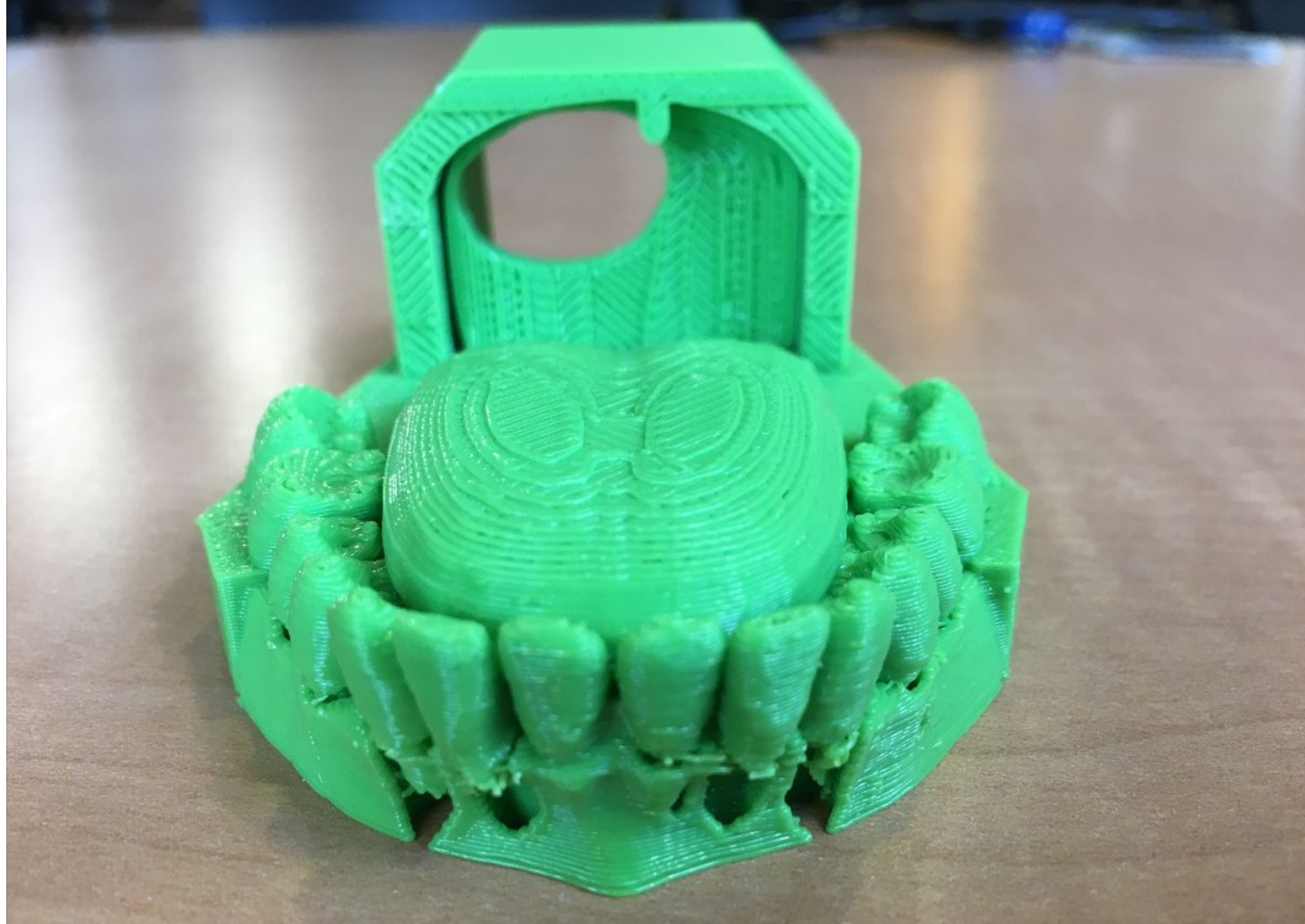
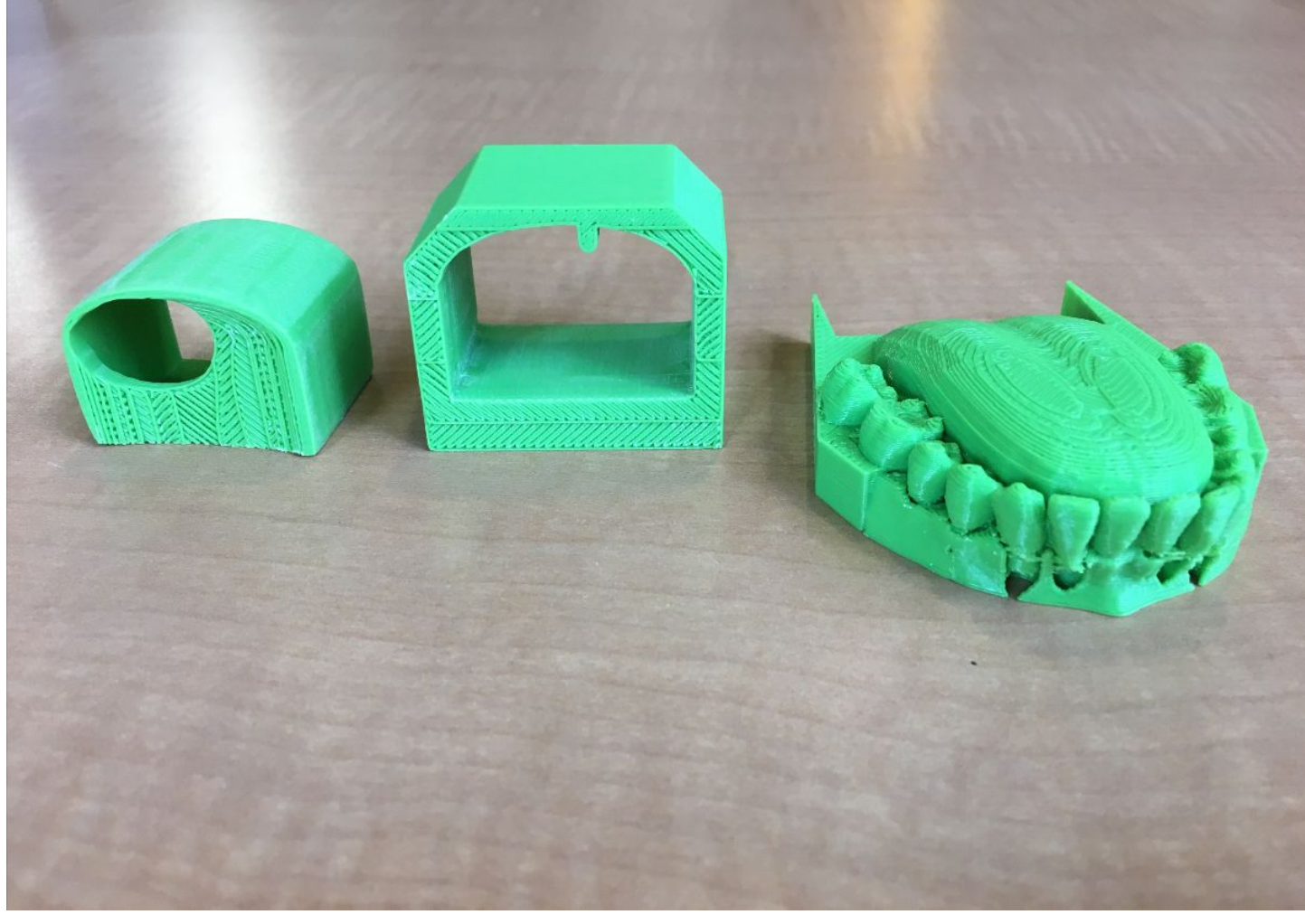
Makers @ HS/HSL: Emergency Medicine Simulation

Maker:	Michael Billet
Affiliation:	Mercy Medical Center and University of Maryland School of Medicine Department of Emergency Medicine
Project:	Design and 3D print a peritonsillar abscess drainage simulator
Used:	Tinkercad.com , Afinia H480

Michael Billet, MD, is an Emergency Medicine physician at Mercy Medical Center and an Assistant Professor of Emergency Medicine. He used the HS/HSL Innovation Space to prototype a device to simulate the procedure for treating a peritonsillar abscess (PTA).

PTAs stem from bacterial infections in the throat tissues next to the tonsils. A pocket of pus forms near the infection causing pain and swelling that can block the throat. "Treatment requires more than antibiotics because antibiotics can't get into that cavity. The abscess needs to be drained", Dr. Billet reports.

As a clinical instructor and member of the Emergency Residency Simulation Group, Dr. Billet often uses simulation devices, known as task trainers, when teaching resident physicians. Such devices allow learners to practice procedural skills without acting on real patients. According to Dr. Billet, no commercial task trainer exists for PTA, so he set out to make one.



Top left: The individual parts that make up the bottom portion of Dr. Billet's design. A balloon filled with liquid (simulating the pus-filled abscess) will be inserted into the left-most cartridge.

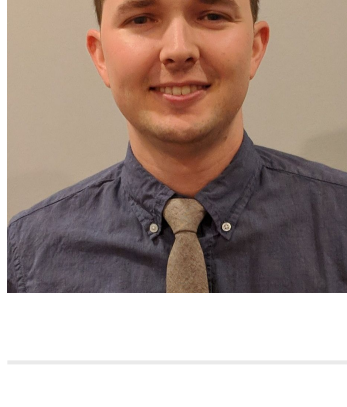
Top Right: The assembled bottom portion of the design.

Bottom: The full assembly of Dr. Billet's current design for a PTA task trainer, to be inserted into a head model in the future.

Dr. Billet's PTA task trainer centers around a 3D printed mouth with a rear compartment that houses a liquid-filled balloon in a particular location. The balloon simulates the abscess that student physicians will incise and drain.

To start, he downloaded a 3D model of a mouth from Thingiverse.com. He then used the 3D design tool Tinkercad.com to customize the roof and floor of the mouth to fit new components to house the balloon. The result is a working prototype that Dr. Billet plans to insert into a head model for a more realistic learning experience.

Michael Billet received his MD from the University of Virginia in 2015. He is a member of the Emergency Residency Simulation Group at the Mercy Medical Center.



Meet the Makers: Samantha Scott, PhD, Founder & CEO, JuneBrain

October 30 @ 12pm, HSHSL



"A Patient's Journey to Medical Device Startup CEO"

The HS/HSL is proud to feature Samantha Scott, PhD, for the next Meet the Makers guest speaker event. Dr. Scott is founder and CEO of JuneBrain, a Maryland-based medical device startup. Dr. Scott has been developing a wearable and non-invasive imaging device that enables multiple sclerosis patients to monitor their disease activity at home, leading to earlier detection of MS attacks and improved monitoring of treatment efficacy. The company was founded in 2017 following her own experiences as a neurology patient. Dr. Scott will discuss the value of using your personal experiences to drive your company forward.

A light lunch will be served, please [RSVP here](#).

Date: Wednesday, October 30, 2019

Time: 12pm - 1pm

Location: Health Sciences and Human Services Library, Gladhill Boardroom

Emerging Tech in the News and Literature

- [A Flexible Wearable Device for Measurement of Cardiac, Electrodermal and Physical Parameters in Mental Healthcare Applications](#) (nih.gov)
- [TAU Scientists Print First 3D Heart Using Patient's Own Cells and Materials](#) (afiau.org)
- [Low-Cost Open Source Ultrasound-Sensing Based Navigational Support for the Visually Impaired](#) (nih.gov)

Upcoming HS/HSL Innovation Space Workshops

Introduction to 3D Printing

- September 25, 2019

Introduction to 3D Modeling

- October 9, 2019

[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 a [HTC Vive VR system](#), three [3D printers](#), two [3D scanners](#), a plotter for [poster printing](#), a [zSpace](#) virtual reality station, [Google Cardboard](#) viewers, a large DNA model, two molecule kits, a button maker, and a 3D printing pen. The staff provides orientations as well as workshops on a regular basis for those who are new to 3D printing and 3D scanning.

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



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