3D Printing Airway Trainers: BME 301

Dates: 3/7/25 - 3/13/25

Client: Kristopher Schroeder, MD
Advisor: Prof. Beth Meyerand

Team:
Matt Sheridan (Communicator)
Dan Altschuler (BWIG and BPAG)
Cody Kryzer (BSAC)
Lance Johnson (Leader)

Problem Statement

Airway management is an integral part of keeping a patient stable in many medical environments. While training medical practitioners with simple airway trainers has improved patient outcomes, this has not had the same effect on patients with abnormal airways. The use of 3D printing from existing patient imaging to create realistic and individualized airway manikins would assist medical professionals, allowing them to practice airway management skills on lifelike models.

Brief Status Update

The team continued research into segmenting softwares, slicing softwares, and 3D printing. The team also reached out again to the client about working towards getting the MRI airway scan, but it seems like there is going to be a bit of a delay. In the meantime, we will work on practicing printing with the scan from Dr. Garcia.

Weekly Goals and Accomplishments

- Team
    - Reached out to the client for the scan and made further contact
- Matt Sheridan
    - Downloaded 3D-slicer and began working with it to become familiar
- Dan Altschuler
    - Continued work into ITK-SNAP
    - Took an online course on segmentation
- Cody Kryzer
    - Figure out how ITK-SNAP works
- Lance Johnson
    - Researched and downloaded ITK-SNAP to get more familiar with the software
    - Began researching 3D-slicer software

Upcoming Goals

- Team
    - 3D print the trachea STL file from Dr. Sylvana-Garcia

- Matt Sheridan
    - Brainstorm trachea connection ideas and gather information from show and tell
    - Write durability testing protocols
- Dan Altschuler
    - Print the STL file with the team
    - Write the medical resident testing protocol and start to generate a google form
- Cody Kryzer
    - Visit makerspace to print the airway from Dr. Sylvia
    - Write protocol for 3D printing
- Lance Johnson
    - Print STL file with the team
    - Write volume-testing protocol