3D Printing Airway Trainers

Progress Report 7

Client: Dr. Kristopher Schroeder

Advisor: Dr. John Puccinelli

Date: 10/25/2024

Team:

Maribel Glodowski mjglodowski2@wisc.edu (Co-leader)

Jack Sperling jwsperling@wisc.edu (Co-leader)

Maiwand Tarazi mtarazi@wisc.edu (BWIG)

Elle Heimer eoheimer@wisc.edu (Team Communicator)

Nathan Klauck nklauck@wisc.edu (BSAC)

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Problem Statement

Airway management is important in keeping a patient stable in various medical environments. While novel techniques and innovative devices for better airway management have decreased the difficulties medical professionals face, developing airway management skills in difficult and unique scenarios is essential to positive and effective patient outcomes. Developing a method of using 3D printing and existing patient imaging to create realistic airway training manikins would allow medical professionals to practice airway management skills with physiologically consistent results.

Brief Status Update

The team started planning the fabrication process and printed a small test trachea. In addition, the team started brainstorming designs for the trainer's framework, and analyzed the trainers that were provided by the client.

Summary of Team Role Accomplishments

- Maribel Glodowski
    - Continue to brainstorm possible framework designs
    - Help deconstruct the provided commercial trainer to better understand the function of each piece
- Jack Sperling
    - Continue to test Democratize3D
    - Print a 50A test piece to determine if this is suitable for the project or not
- Maiwand Tarazi
    - Acquainted with democratize3D
    - Continued practice with 3D slicing
- Elle Heimer
    - Explored democratize3D and other options for getting a CT scan to an .stl file
    - Communicated our progress with client
- Nathan
    - Preparation for BSAC meeting
    - Attended BSAC exec meeting
- Ilia
    - Met with team to establish goals for the two “mini-teams” we’ve created
    - Begun research on possible designs and how to attach the head component to the pathology

Weekly/Ongoing Difficulties

- None to report currently

Upcoming Team and Individual Goals:

The team goals include obtaining patient DICOM imaging from the client or open-source databases and printing the first prototype airway.

- Maribel Glodowski

    - Choose materials and parts needed to be ordered for the framework
    - Start modeling the design using SolidWorks
- Jack Sperling
    - Research if there is another autosegmentation program available for a low cost to replace democratize3D
    - Retrieve 50A print from the makerspace and determine which material is best for the project
- Maiwand Tarazi
    - Print out airway anatomy at Makerspace based on anatomical outlines created on democratize3d/slicing
    - Present prototype at show and tell
- Elle Heimer
    - Communicate with client about what airways to replicate and select one
    - Prepare for show and tell with designs
- Nathan Klauck
    - Measured relevant features of airsim manikin
    - Looked into a method of disassembling/reassembling airsim manikin
    - Ranked methods of attachment and connection locations
- Ilia
    - Finalize slides for presentation
    - Practice presentation with team to ensure it is cohesive

Activities Timesheet

Team Member	Time for the Week	Total Time for the Semester
Maribel Glodowski	3	23
Jack Sperling	3	21
Maiwand Tarazi	2	20
Elle Heimer	2	17
Nathan Klauck	3	19
Ilia Mikhailenko	3	16

Expenses:

- No expenses to report at this time

Project Timeline:

Task	Sept.			Oct.				Nov.					Dec.
	13	**20**	**27**	**4**	**11**	**18**	**25**	**1**	**8**	**15**	**22**	**29**	**6**
Project													
Brainstorming	**X**	**X**	**X**	**X**	**X**	**X**	**X**						
Researching	**X**	**X**	**X**	**X**									
Manufacturing					**X**	**X**	**X**						
Testing/Remodeling													

Deliverables													
Progress report	**X**	**X**	**X**	**X**	**X**	**X**	**X**						
PDS		**X**		**X**									
Mid-semester			**X**	**X**	**X**								
Final													
Meetings													
Team	**X**	**X**	**X**	**X**	**X**	**X**	**X**						
Advisor	**X**	**X**	**X**		**X**	**X**	**X**						
Client	**X**			**X**									
Website													
Update	**X**	**X**	**X**	**X**	**X**	**X**	**X**						