3D Printing Airway Trainers

Progress Report 6

Client: Dr. Kristopher Schroeder

Advisor: Dr. John Puccinelli

Date: 10/18/2024

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.

Summary of Team Role Accomplishments

- Maribel Glodowski
    - Met with framework subteam and discussed upcoming goals
    - Brainstormed possible framework designs
- Jack Sperling
    - Work with makerspace staff to print samples of the two flexible materials that they have: 50A and 80A
        - Printed 80A and BioMed Clear test prints
    - Continue working with the client to find specific airway scans to segment for printing
- Maiwand Tarazi
    - Downloaded 3D slicer; found an open source ENT
    - Continued research on DICOM file based anatomical outlines
- Elle Heimer
    - Made fabrication plans and explored 3D slicer software
    - Communicated our progress with client
- Nathan
    - Preparation for BSAC exec meeting
    - Attended BSAC 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
    - Continue to test Democratize3D
    - Print a 50A test piece to determine if this is suitable for the project or not
- Maiwand Tarazi
    - Print out airway anatomy at Makerspace
    - Test anatomy biomechanics and quality
- Elle Heimer
    - Continue communicating with client about what airways to replicate
    - Print out test airways with Makerspace collaboration
- Nathan Klauck
    - Research for modeling of the surrounding aspects of the airway trainer and their functionality (face structure, neck mechanics, method of attachment)
    - Looked into methods of 3D scanning a manikin
- 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	20
Jack Sperling	3	21
Maiwand Tarazi	3	18
Elle Heimer	2	15
Nathan Klauck	3	16
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**							
Researching	**X**	**X**	**X**	**X**									
Manufacturing					**X**	**X**							
Testing/Remodeling													

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