3D Printing Airway Trainers

Progress Report 8

Client: Dr. Kristopher Schroeder

Advisor: Dr. John Puccinelli

Date: 11/08/2024

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)

Ilia Mikhailenko imikhailenko@wisc.edu (BPAG)

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 continued to explore different options of software programs for segmentation and modeling. The trainer base, and neck hinge was modeled in SolidWorks, and a fastener system was developed.

Summary of Team Role Accomplishments

- Maribel Glodowski
    - Continued to modeling trainer neck hinge in SolidWorks
    - Looked into ordering necessary materials
- Jack Sperling
    - Continue working with 3dSlicer to get a printable trachea – will also test in SOLIDWORKS
    - Work with Elle and Maiwand to follow up with companies about imaging software potential uses
    - Began writing documentation guiding the post processing aspect of the model in SOLIDWORKS
- Maiwand Tarazi
    - Worked with 3D slicer to develop a anatomical sketch/model of airway
    - Continue to wait from Synopsis regarding using their slicing software
- Elle Heimer
    - Sample segmented on 3D slicer
    - Communicated our progress with client
    - Communicated with slicing companies
- Nathan
    - Attended BSAC exec meeting
- Ilia
    - Continued to further modify the SolidWorks base design

Weekly/Ongoing Difficulties

- None to report currently

Upcoming Team and Individual Goals:

The team goals include finding a software that will be useful for our intended application and continue fabrication of the framework.

- Maribel Glodowski
    - Order any additional materials that are needed
    - Continue refining trainer designs and decide on single airway to jaw attachment strategies
- Jack Sperling
    - Continue writing documentation guiding the post processing aspect of the model in SOLIDWORKS
    - Troubleshoot errors that are occurring when turning an STL into a mesh object
- Maiwand Tarazi
    - Continue to work with Jack and Elle in 3D slicer to get printable anatomy
    - Hopefully get response from synopsis to get 30 day free trial
- Elle Heimer
    - Communicate with client about what airways to replicate
    - Search for ways to get DICOM to .stl
- Nathan Klauck
    - 3D printed airway support
- 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	4	30
Jack Sperling	5	33
Maiwand Tarazi	3	23
Elle Heimer	2	22
Nathan Klauck	1	22
Ilia Mikhailenko	1	22

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**	**X**	**X**				
Testing/Remodeling													

Deliverables													
Progress report	**X**	**X**	**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**	**X**	**X**				
Advisor	**X**	**X**	**X**		**X**	**X**	**X**		**X**				
Client	**X**			**X**									
Website													
Update	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**				