

Title: 3D Printed Respiratory Motion Phantom PgR 5

Date: 9/30/2026

Client: Dr. Andrew Shepard

Advisor: Prof. Mehmet Orman

Team:

Student 1: Matthew Niemuth - Team Leader

Student 2: Royal Swick - Communicator

Student 3: Drew Kruse - BSAC

Student 4: Natalie Waibel - BWIG

Student 5: Avi Ganti - Co-BPAG

Student 6: Jahan Ingraham - Co-BPAG

Problem statement: Design and Fabricate a 3D-printed respiratory motion phantom insert that simulates two lung lesions with realistic density and anatomy for evaluation of real-time tumor tracking during radiotherapy.

Brief status update: This week our team met with our client again to discuss preliminary designs. They want us to move forward with design 3 from the design matrix, the Automated Standardized Insert System.

Additionally, the team is working on the preliminary report to be submitted by the extension deadline.

Difficulties / advice requests: N/A

Current design: Nesting Doll Design

Materials and expenses:

Item	Description	Manufac-turer	Mft Pt#	Vendo r	Vendo r Cat#	Date	#	Cost Each	Total	Link
Category 1										
									\$0.00	
									\$0.00	
Category 2										
									\$0.00	
									\$0.00	
								TOTAL:	\$0.00	

Goals

Major team goals for the next week

1. Begin researching the feasibility of the Automated Standardized Insert System so we can alert our client if we have to go a different direction.
2. Finish Preliminary Report
3. Learn more about how AI might help automate the system

Next week's individual goals

- Royal Swick
 - I want to conduct research on the feasibility of the automated standardized insert system. Work on getting the preliminary report done.
- Matthew Niemuth
 - Look into how AI can be used to automating and standardizing processes so we can apply its use to standardizing and automating our tumor inserts. Also make sure the report is done by Monday.
- Drew Kruse
 - Reflect on the feedback we get from our preliminary presentation and continue to flush out the design we chose. I will complete my part of the report and hold everyone accountable for their parts.
- Natalie Waibel
 - Develop and finalize our final design that we chose from the feedback we received from our preliminary presentation. Look into the automating software for tumor inserts. Finish the report by Monday. Meet with group to discuss final design.
- Jahan Ingraham
 - Look into methods of automatically filling in the tumor with surrounding weather it be set code or an AI learning algorithm. Begin first steps of fabricating the phantom. Look over feedback from group and complete the feedback fruits reflection.
- Avi Ganti
 - Look over peer feedback and complete the reflection on how I can contribute to the team more. Research more about automating CAD design to start working on design 3.

Timeline:

Task	Sep			Oct					Nov				Dec	
	12	19	26	3	8	17	24	31	7	14	21	28	5	10
Project R&D														
Research	X	X	X											
Design			X											
Prototyping														
Testings														
Deliverables														
Progress Reports	X	X	X											
PDS		X												
Design Matrix			X											
Prelim Presentation														
Prelim Report														
Final Poster														
Final Report														
Meetings														
Client		X												
Advisor	X	X	X											
Website														
Update														

Filled boxes = projected timeline

X = task was worked on or completed

Detailed accomplishments

Previous week's goals and accomplishments

- Royal Swick:
 - Previous Goals: Set up a meeting with our clients to discuss our preliminary designs and get feedback on which design to move forward with.
 - Accomplishments: I set up a teams meeting and spoke with our clients and they wanted us to move forward with design 3. I completed my portion of the preliminary design report which included the testing and results and conclusion. I also completed the feedback fruits team reviews.
- Matthew Niemuth
 - Previous Goals: Research materials to incorporate into the phantom design. Meet with clients to receive feedback on current preliminary designs. Work on getting the preliminary report done.
 - Accomplishments: I worked on my part of the preliminary report, getting caught up on what our client liked about our designs and which design to move forward with from Royal as I could not attend the meeting when I had a lab. I also began to think about the feasibility of the design they want us to move forward with and if it is possible with the technology we have on campus. I also completed the feedback fruit reviews of my teammates. Finally, I spent time uploading client

meetings, team meetings, and the preliminary presentation to the team activities folder in LabArchives.

- Drew Kruse
 - Previous Goals: Reflect on the feedback we get from our preliminary presentation and continue to flush out the design we chose. I will complete my part of the report and hold everyone accountable for their parts.
 - Accomplishments: Went over all of the feedback from our preliminary presentation. I met with the clients to go over all of our designs to see which one fits their needs the best. We think we have an idea of what we need to do over the next few weeks. I worked on the preliminary design report. Also, I completed feedback fruits in a timely manner.
- Jahan Ingraham
 - Previous Goals: Work on and present our preliminary design ideas and use feedback from clients to select winning designs along with starting on the preliminary report.
 - Accomplishments: Presented my portion of the presentation which succeeded due to our group meeting and practice. I also completed feedback fruits for the team, giving constructive feedback to each group member.
- Natalie Waibel
 - Previous Goals: Meet with clients to discuss our preliminary designs. Focus on material selection. Finish sketching out our chosen design and CAD it. Work on the preliminary report!!
 - Accomplishments: Worked on the background of the preliminary report, and presented our designs and project to our advisor and room of BME peers. Completed the feedback fruits team reviews.
- Avi Ganti
 - Previous Goals: Complete the Preliminary Design Presentation and reflect on feedback in order to further the design.
 - Accomplishments: Presented our designs and got feedback from advisors. Discussed with group about choosing design 3 based on client feedback. Completed feedback fruits evaluation

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Matthew Niemuth	10/7/2026	Worked on preliminary presentation, feedback fruit reviews of teammates, getting caught up on feedback on designs from clients, and thinking about feasibility of the design they want us to move forward with and a potential process we might take to get our design working. Uploaded team meetings, client meetings, and preliminary presentation to LabArchives team activities folder.	4	4	24

Royal Swick	10/7/2026	I set up a teams meeting and spoke with our clients and they wanted us to move forward with design 3. I completed my portion of the preliminary design report which included the testing and results and conclusion. I also completed the feedback fruits team reviews.	4	4	22
Drew Kruse	10/7/2026	- Reviewed all feedback from the preliminary presentation. - Met with the clients to evaluate design options and determine which best meets their needs. - Helped identify the project direction and next steps for the coming weeks. - Contributed to the preliminary design report. - Completed Feedback Fruits assignments in a timely manner.	5	5	20
Natalie Waibel	10/8/26	Worked on the background of the preliminary report, and presented our designs and project to our advisor and room of BME peers. Completed the feedback fruits team reviews.	4	4	19
Avi Ganti	10/7/26	- Met with group to polish and practice presentation - Presented to peers and advisors - Discussed presentation feedback and where to improve with group - Completed peer reviews	4	4	19
Jahan Ingraham	10/7/16	- Brinstoned designs for the lung phantom. -Met with group to create matrix and run through presentation. -Completed the presentation along with the design matrix as a group.	7	7	19

		-Feedback Fruits: Giving feedback to teammates -Preliminary report			
--	--	--	--	--	--