

## ***PRINT-A-PUNCH***

Date: November 9th, 2024 to November 15th, 2024

Client: Prof. Colleen Witzenburg ([witzenburg@wisc.edu](mailto:witzenburg@wisc.edu)) and Mr. Daniel Pearce ([dppearce@wisc.edu](mailto:dppearce@wisc.edu))

Advisor: Dr. Megan Settell - [settell@wisc.edu](mailto:settell@wisc.edu)

Daniel Pies - [dpies@wisc.edu](mailto:dpies@wisc.edu) - Team Leader

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Cole Miller - [ctmiller8@wisc.edu](mailto:ctmiller8@wisc.edu) - BSAC

### **Problem Statement**

In order to carry out effective biaxial testing of tissue, a precise, symmetric sample must be cut. A cruciform shaped sample allows this testing to be performed however there are not currently any products that can uniformly cut this type of sample. The goal of this project is to generate a method to use factory produced razor blades to cut small samples of tissue so biaxial tensile testing is effective while keeping the product simple and inexpensive.

### **Brief Status Update**

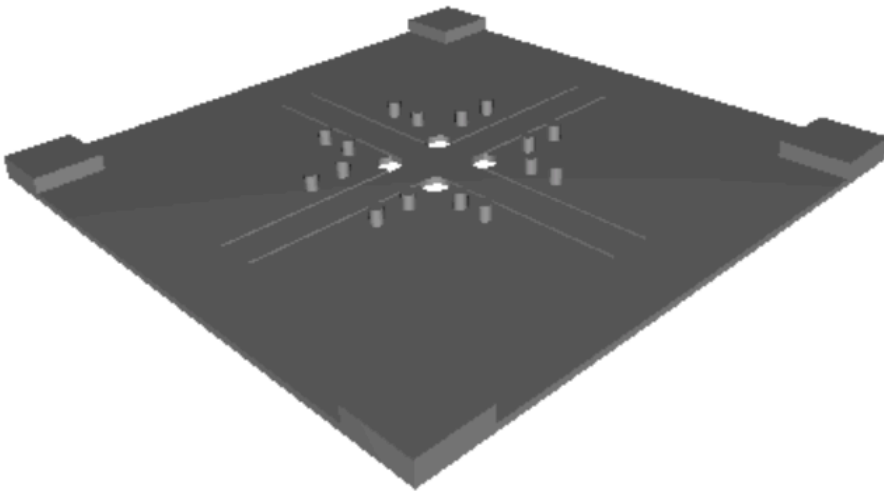
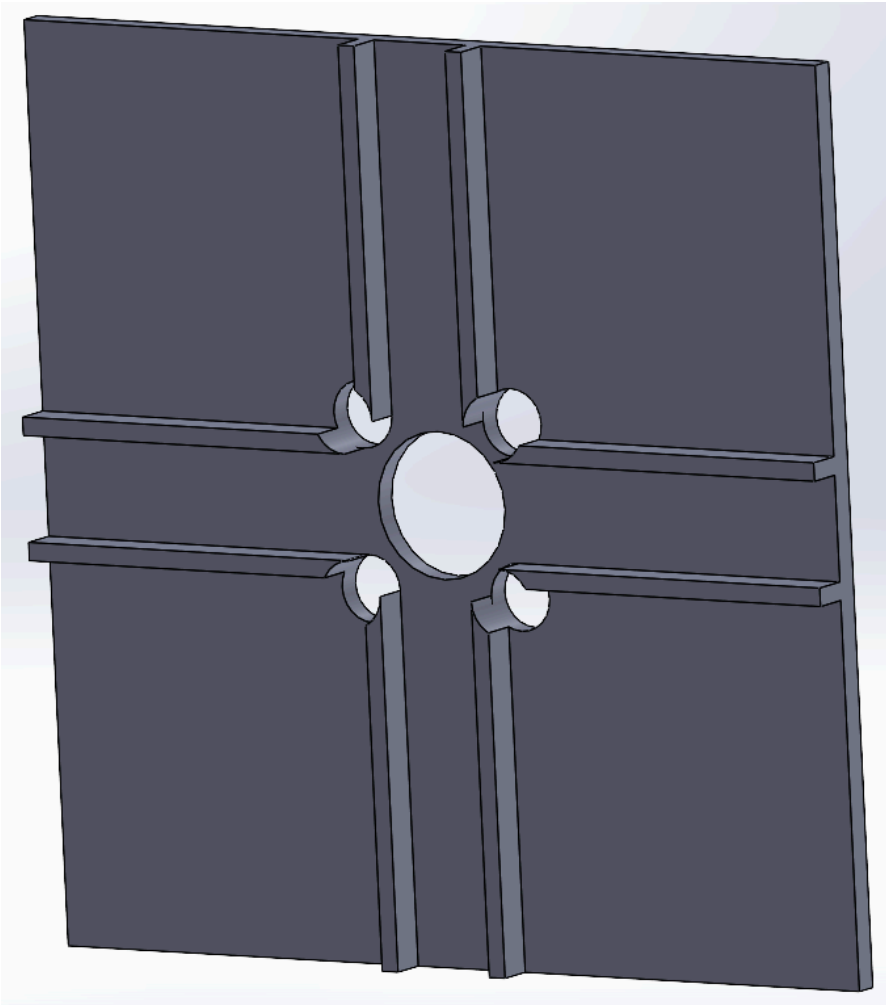
This week, the team did not have any notable progression. There was continued development of the design in response to feedback from Mr. Pearce, and the team began working on the testing protocol and smoothing out issues with the analysis code for detecting the symmetry of the cruciforms.

### **Difficulties / Advice Requests**

- The team would like to meet with Mr. Daniel Pearce as soon as convenient to discuss the final prototype

### **Current Design**

The team is currently deliberating between 2 final designs. The intention is to meet with the client as soon as possible to finalize and select one design to move forwards with. As shown below, the first of the two designs uses the idea of punching the four holes while creating perforations in the sample to freehand with a razor blade. The second design uses slits in the jig to streamline the direction of the cutting on the arms.



## Materials and expenses

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
<b>Category 1</b>										
3D printed material	Resin prototypes	Makerspace				10/15/2024	2	\$0.76	\$1.51	
3D printed material	Resin prototypes round 2	Makerspace				10/25/2024	3	\$5.37	\$16.11	
<b>Category 2</b>										
									\$0.00	
									\$0.00	
								<b>TOTAL:</b>	<b>\$17.62</b>	

## Major Team Goals For The Next Week

- Meet as a team to discuss ways of securing sample to prevent torsion and lateral movement during cutting
- Make changes to design at team meeting
- Continue to print new iterations to designs for evaluation

## Next Week's Individual Goals

- Daniel Pies
  - Research ways to secure sample
  - Work on testing protocols
  - Meet with client to finalize prototype
- Colin Bailey
  - Determine optimal testing method
  - Conduct testing
  - Perform testing analysis
- Cole Miller
  - Conduct testing of current prototypes
  - Make last adjustments to designs
  - Begin work on final presentations
- Emmett Jones
  - Conduct testing of current designs
  - Finish last improvements of the final design
  - Begin final report and final poster
- Kendra Ohde
  - Conduct testing of current designs
  - Discuss improvements of the final design
  - Begin final report and final poster

## Timeline

Task	September				October				November					December	
	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13
<b>Project R&amp;D</b>															
Empathize	X	X	X												
Background		X	X	X	X	X									
Prototyping						X	X	X	X						
Testing										X	X				
<b>Deliverables</b>															
Progress Reports		X	X	X	X	X	X	X	X	X	X				
Prelim Presentation					X										
Final Poster															
<b>Meetings</b>															
Client		X		X					X						
Advisor	X	X	X	X	X		X	X		X	X				
<b>Website</b>															
Update	X	X	X	X	X	X	X	X	X	X	X				

Filled boxes = projected timeline  
 X = task was worked on or completed

## Major Team Goals For The Previous Week

- Complete progress report
- Meet to discuss final prototypes

## Previous Week's Goals and Accomplishments

- Daniel Pies
  - Created progress report
  - Attended team meeting
  - Take notes at team meeting and communicate to team members not present
- Colin Bailey
  - Attended team meeting
  - Discussed testing procedures
- Cole Miller
  - Research testing benchmarks
  - Brainstormed testing process

- Brainstormed final changes to design
- Emmett Jones
  - CAD new design with system to keep sample in place
  - Brainstormed testing methods
- Kendra Ohde
  - Print out prototypes
  - Brainstorm testing
  - Attend team meeting

### Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Team	11/9-11/15	Advisor meeting	.5	.5	12
Daniel Pies	11/9-11/15	Create progress report Attend team fabrication meeting	.5 .5	1	28
Colin Bailey	11/9-11/15	Attended team meeting Discussed testing procedures	.5 .5	1	25
Emmett Jones	11/9-11/15	New CAD model Update Website	.5 .5	1	24
Cole Miller	11/9-11/15	Testing Research Brainstorm Final Design Changes	.5 .5	1	24.5
Kendra Ohde	11/9-11/15	Print out prototypes Attend team meeting/ Discussed testing procedures	.5 .5	1	21
			<b>Total</b>	5.5	134.5