Approximating Surface Matrix Band for Dentist to Use for Patients

Project Page

Date: February 15st, 2026 - February 19th, 2026

Client: Dr. Donald Tipple
Advisor: Prof. Beth Meyerand
Team:

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Problem statement

Surface matrix bands are devices used by dentists to separate adjacent teeth during restorations of interproximal cavities (cavities found in-between two teeth). The matrix band serves to support the restoration material, to provide shape and contour to the tooth being restored, and to protect the adjacent tooth. Ideally, the width of the space between the two adjacent teeth is just large enough to fit one matrix band in order to ensure close proximal contact area, which prevents food impaction and decay. In the case of two cavities on two adjacent teeth, this process is tedious, as the dentist must complete the process from start to finish for each adjacent tooth individually. The goal of this project is to create a dental matrix band that effectively partitions adjacent teeth for more efficient tooth restoration procedures on interproximal cavities by making it possible to complete two adjacent restorations simultaneously.

Brief status update

Dr. Williams is testing different settings on the laser cutter to minimize thermal warping in the material. Updated SolidWorks files of the prototype have also been sent to him for preliminary testing of cutting the design.

Summary of weekly team member design accomplishments

- Roshan Patel
    - Matlab code for data analysis
- Anya Hadim
    - Completed the preliminary report
    - Researched better materials for laser cutting warping issue
- Keleous Lange
    - Completed preliminary report
- Tanya Predko
    - Completed assigned portions of the preliminary report
- Joseph Koch
    - Preliminary report

Difficulties / advice requests

We are currently exploring different material options as the laser cutter is causing discoloration and warping into the steel.

Current design

N/A

Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Date	#	Cost Each	Total	Link
Category 1: Testing Materials									
Stainless Steel sheet	316 Stainless Steel Shim Stock	McMaster Carr	2317 K51	McMaster Carr	11/07	1	22.55	$22.55	https://www.mcmaster.com/2317K51/
								$0.00	
Category 2: Final Prototype									
								$0.00	
								$0.00	
							TOTAL:	**$22.55**	

Major team goals for the next week

1. Fix the svg file issue with Dr. Williams to avoid discontinuous cuts
2. Order brass to see if it fixes the warping problem

Next week's individual goals

- Roshan Patel
    - Update testing protocol
- Anya Hadim
    - Find and order different materials for Dr. Williams to use
    - Brainstorm other solutions to get around the laser cutting problems
- Keleous Lange
    - Research materials that might be helpful for Dr. Williams to test cut
- Tanya Predko
    - Schedule a team meeting to discuss fabrication issues
- Joseph Koch
    - Work on SolidWorks simulation

Timeline

Task	February				March				April					May	
	6	13	20	27	6	13	20	27	3	10	17	24	3	1	8
Project R&D															
Empathize															
Background…	x														
Prototyping		x	x	x											
Testings															
Deliverables															
Progress Reports	x	x	x	x											
Prelim presentation		x													
Final Poster															

Meetings															
Client	x														
Advisor	x	x	x												
Website															
Update															

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

Previous week's goals and accomplishments

- N/A