

B R A Y A N M A Y A

M E C H A N I C A L E N G I N E E R I N G

P O R T F O L I O

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PROJECTS

ENVIRONMENTAL JUSTICE IN RICHMOND,
CA: RESILIENCE & IDENTITY

DESIGN AND 3D MODEL OF A DESK
EXTENDER

DESIGN AND 3D MODEL OF A WIND
TURBINE

SOLIDWORKS PARTS

CREO PARTS

For more details on
each project, please
feel free to scan the QR
code!

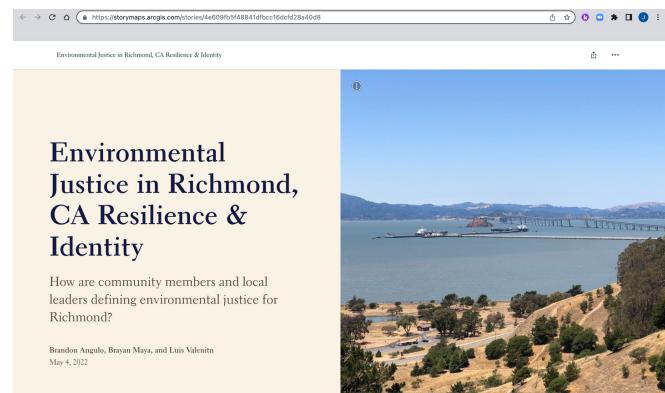


Google Drive folder of
all projects listed in
this portfolio as well as
other projects.

ENVIRONMENTAL JUSTICE IN RICHMOND, CA: RESILIENCE & IDENTITY

SKILLS APPLIED:

- Programming: Python
- Data Wrangling
- Exploratory Data Analysis
- Data Visualization
- Contextualizing Data



DESCRIPTION:

Our project focuses on raising awareness about the environmental injustices in Richmond, CA. We believe in the necessity to provide both narratives and data to encapsulate as much of the city's struggles as much as possible. Through a combination of an ethnohistoric lens and quantitative data, the project shows the deep history of the Richmond community intertwined with the realities of environmental discrimination faced by communities of color. Using engineering related skills, I was able to create graphical visualizations using raw data sourced from various environmental protection agencies. The result was a story that connected both the narrative of the Richmond community and the statistics surrounding the issue.

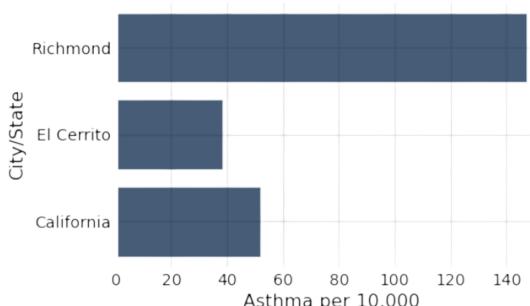


Figure 2: Comparison of Asthma

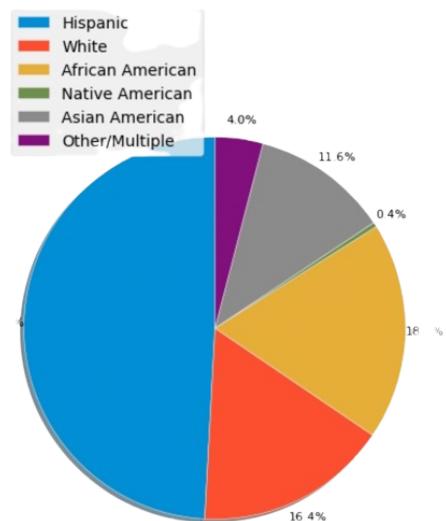


Figure 3: Demographics in Richmond

Collaborators: Luis Valentin and Brandon Angulo

DESIGN AND 3D MODEL OF A DESK EXTENDER

SKILLS APPLIED:

- Engineering Drawings: Solidworks
- Use of Machine-Shop Tools and Manufacturing

DESCRIPTION:

This project's aim is to solve the issue of limited desk space due to having a small desk area. Using knowledge of various manufacturing processes and their relative tolerance, we created a design from the ground up that solved an issue plaguing college students. My role in the team was verifying the designs, ensuring our designs were within given tolerances, and leading the manufacturing of the final prototype. Through the use of various fits and GD&T, we developed a design that maximized the tolerance of the parts while still ensuring the functionality of the product. This project taught me the importance of manufacturing processes and communication needed between the engineers and manufacturers to produce the best products for consumers.

ITEM NO.	PART NAME	PART NUMBER	MATERIAL	DESCRIPTION	QTY.
1	Tray Table	1	MDF Plywood		1
2	91251A544 (Screw)	N/A	Alloy Steel	Black-Oxide Alloy Steel Socket Head Screw (Stock Item)	1
3	Channel Rails	2	Aluminum	(Stock Item)	2
4	Wheel pins	N/A	Stainless Steel	(Stock Item)	12
5	Wheels	3	ABS		12
6	Clamp_ScrewCap	4	PLA		3
7	90031A133 (Screw)	N/A	Steel	Phillips Flat Head Screws for Wood (Stock Item)	24
8	Clamp_Frame	5	Durable Engineering Resin		3
9	Clamp_Screw	6	Durable Engineering Resin		3
10	Base	7	MDF Plywood		1

SOLIDWORKS Educational Product. For Instructional Use Only.

Figure 2: Bill of Materials

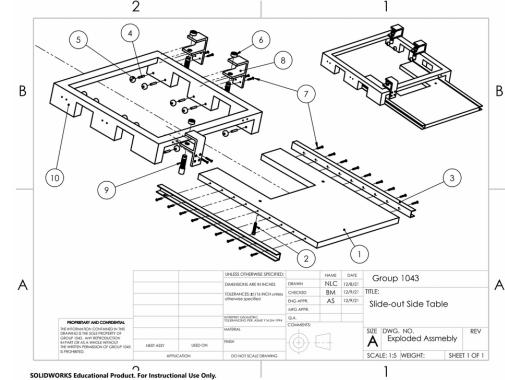


Figure 1: Engineering Drawing of Desk Extender

	Connects Component #... (A)	...to component # or external object (B)	Function of fit	ANSI class of fit	Component A critical dimension and tolerance	Component B critical dimension and tolerance
1	1 (Base)	2 (Clamp Frame)	To connect the body of our product to the user's desk	Clamps screwed into base	N/A Pre-Manufacturing Part (Screws)	N/A Pre-Manufacturing Part (Screws)
2	4 (Wheels)	6 (Rails)	Provides a guide so that the desk can be pulled out and pushed back in when needed.	RC7 (Clearance Fit)	0.7475-.0012	0.75+.002
3	5 (Pin)	1 (Base)	Connects the overall wheels to the base of the device that lies under the desk.	FN 2 (Interference Fit)	0.1257+.0003	0.125+.0005
4	2 (Clamp Frame)	3 (Clamp Screw)	Adjusts the fit and locks the desk into place, allows the clamp screw to thread and tighten through the clamp	RC1 (Clearance Fit)	0.5+.0003	0.49975-.0002
5	4 (Wheels)	5 (Pin)	Allows Wheel to spin without interference.	RC7 (Clearance Fit)	0.125+.0012	0.1238-.0007
6	6 (Rails)	7 (Tray Table)	Connection the rails to the sliding table to allow the table to slide along the wheels.	Rails screwed into tray table	N/A Pre-Manufacturing Part (Screws)	N/A
7	Desk	Clamp Frame and Clamp Screw	Secures product to desk	LN 1(Interference Fit)	N/A	N/A

Figure 3: Tolerance of Each Part of the Desk Extender

Collaborators: Eugene Ahn, Alan Cervantes, Nicholas Chard, and Aidan Sussman

D E S I G N A N D 3 D M O D E L O F A W I N D T U R B I N E

SKILLS APPLIED:

- CAD and Engineering Drawings: SolidWorks
- FEA Analysis
- Data Analysis

DESCRIPTION:

The goal of this project is to design an efficient wind turbine structure that maximizes the stiffness, efficiency, and stress distribution while also minimizing its weight. Using SolidWorks and FEA analysis, we worked towards minimizing unwanted factors like mass, deflection, and low factors of safety. While everyone in the group was encouraged to create their own designs, I played a big role in the final design of our wind turbine by developing blades that could potentially increase power generated by the turbine. Through this project, I realized the importance of designing around constraints while ensuring safety and functionality.

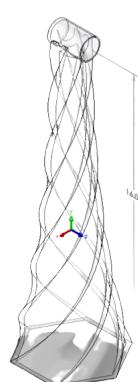


Figure 2: My Design of a Wind Turbine



Figure 1: Final Wind Turbine Design

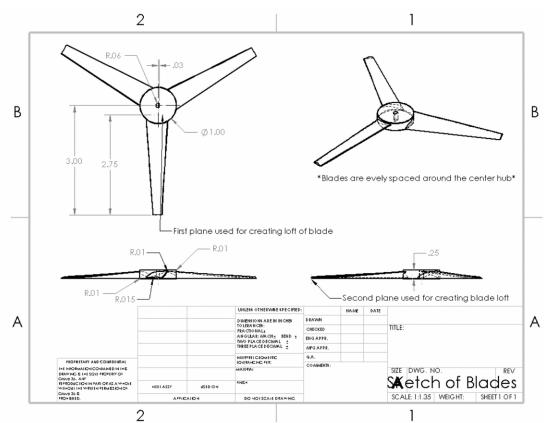
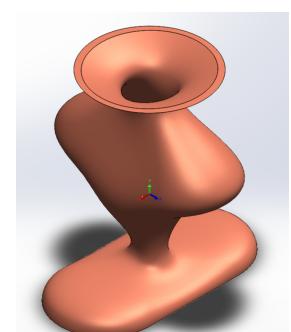
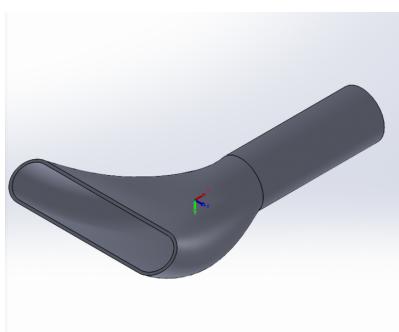
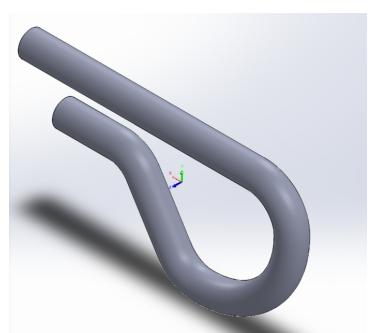
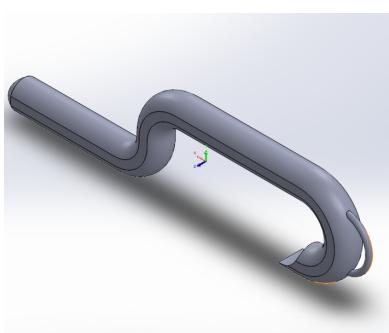
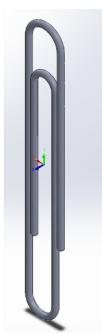
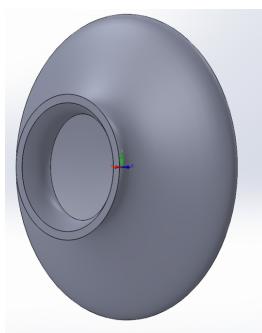
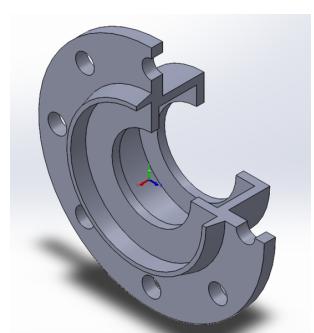
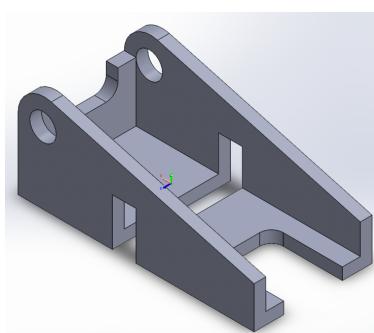
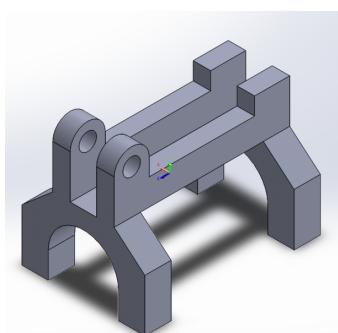
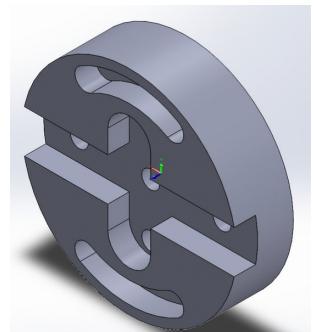
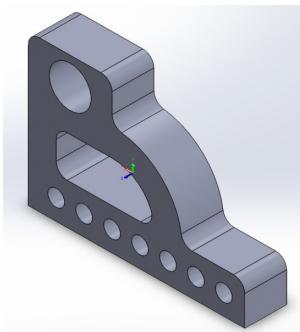
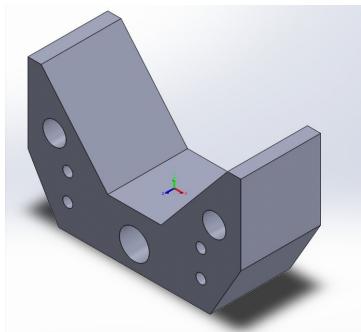


Figure 3: My Design of the Blades, Used for the Final Design

Collaborators: Vanesa Canales, Yuxin Liu, Shotaro Yamaguchi, Matthew Garcia, and Sammy Sipaseuth

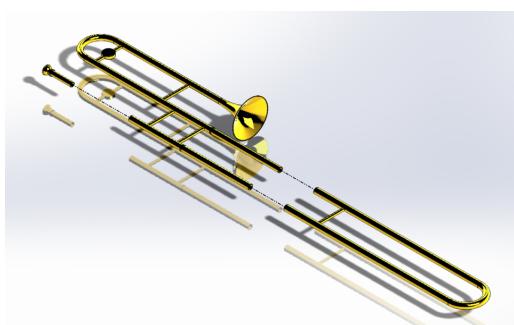
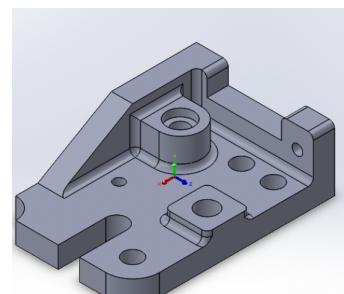
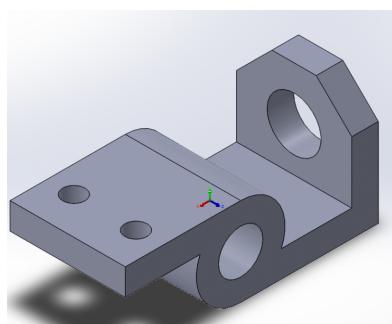
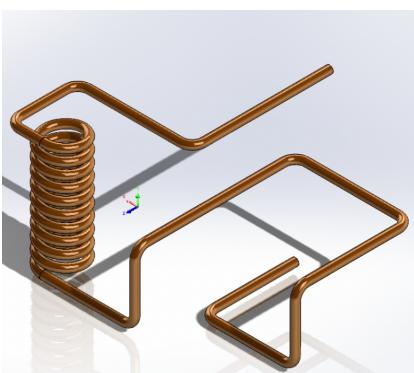
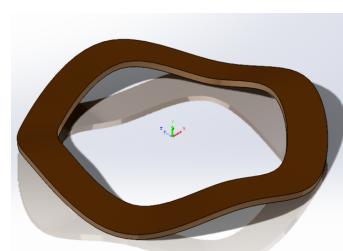
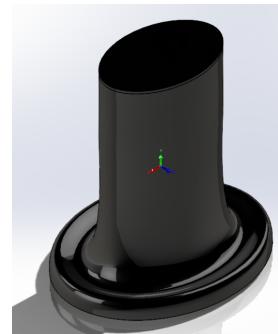
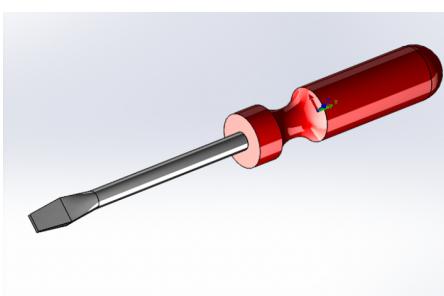
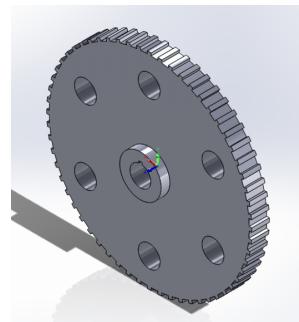
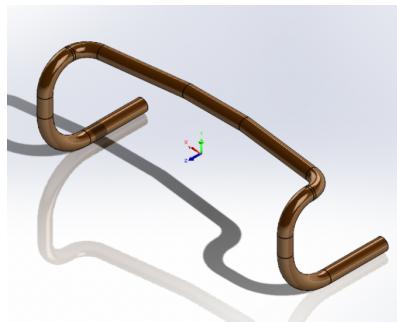
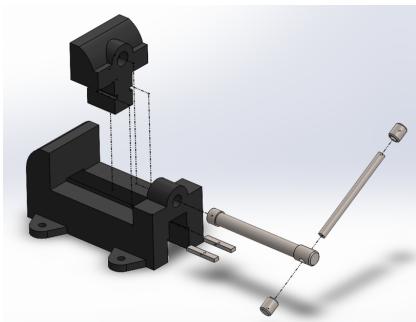
S O L I D W O R K S P A R T S

The following parts were made for my 3D Modeling and Design class.



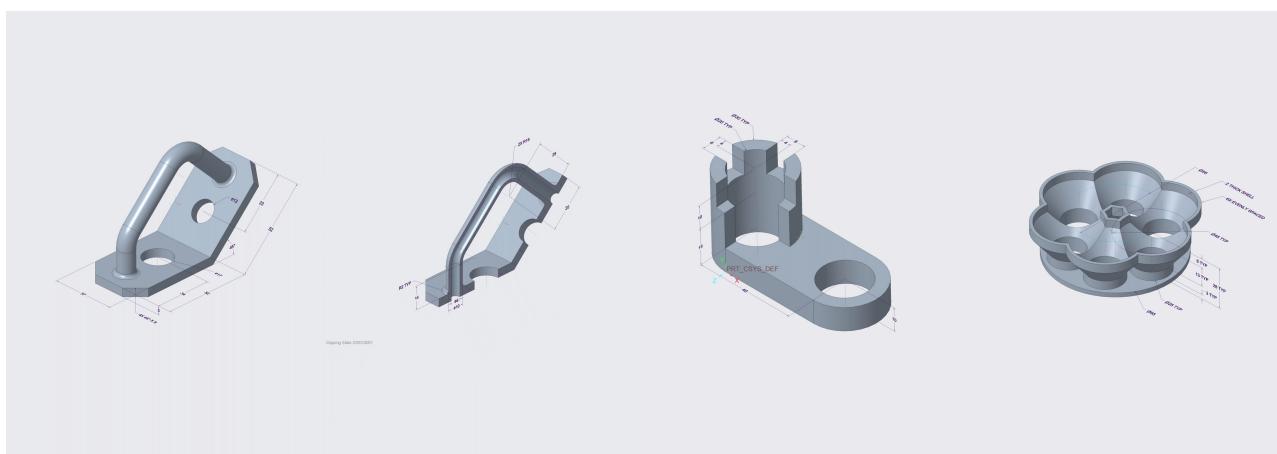
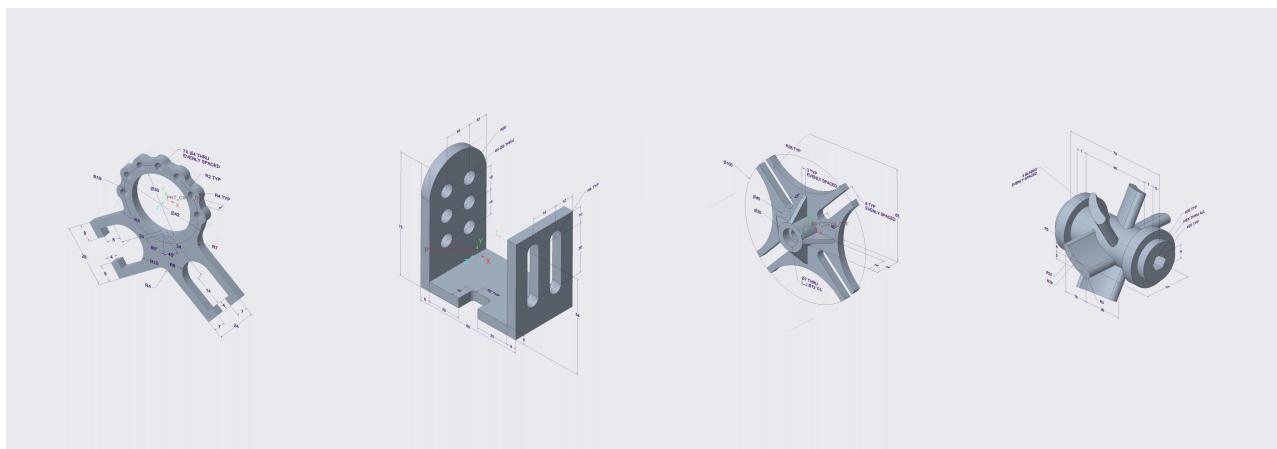
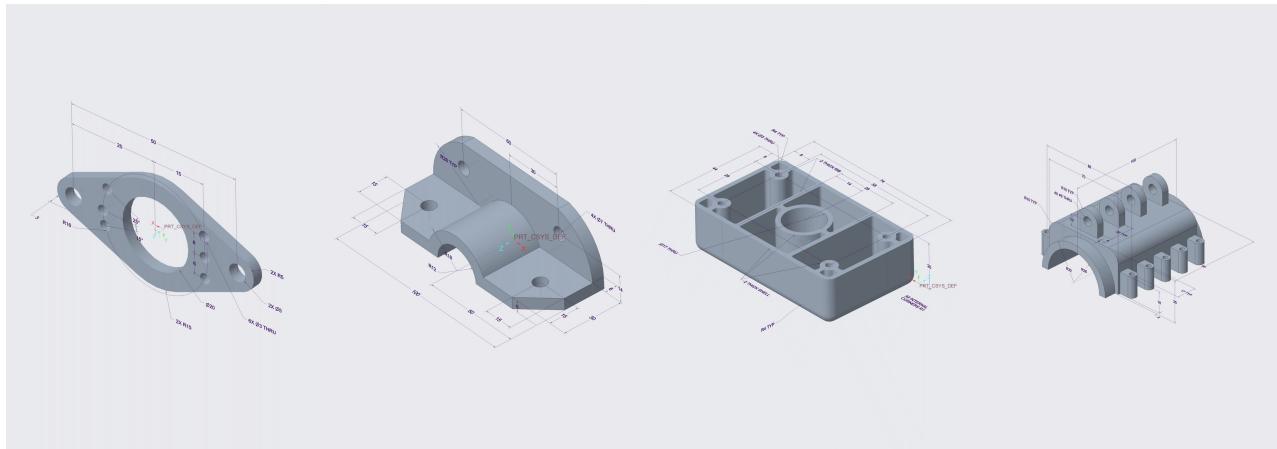
S O L I D W O R K S P A R T S

The following parts were made for my 3D Modeling and Design class.



C R E O P A R T S

The following parts were made for my Advanced Engineering Design Graphics class.



C R E O P A R T S

The following parts were made for my Advanced Engineering Design Graphics class.

