Emily Piatt

Engineering Design Portfolio

University of Cincinnati, Mechanical Engineering Class of 2019
Mathematics Minor
Cincinnatus Scholar

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Mechanical Engineering Co-op, American Showa, Inc.

Summer Semester 2016 and Spring semester 2017, I completed my first two Co-op rotations in the Power Steering Department at America Showa, Inc. in Subury, Ohio. In this position, I performed Test Lab activities for strength and durability of steering system components, conducted Root Cause Analysis for warranty claims, and completed associated reports for both. Utilizing CATIA V5, I designed and built components for current testing equipment, as well as a new jig for performance testing, which also required holding review meetings with the team and my supervisor. I also designed and built safety guarding for the testing machines.

Engineering Models Teaching Assistant

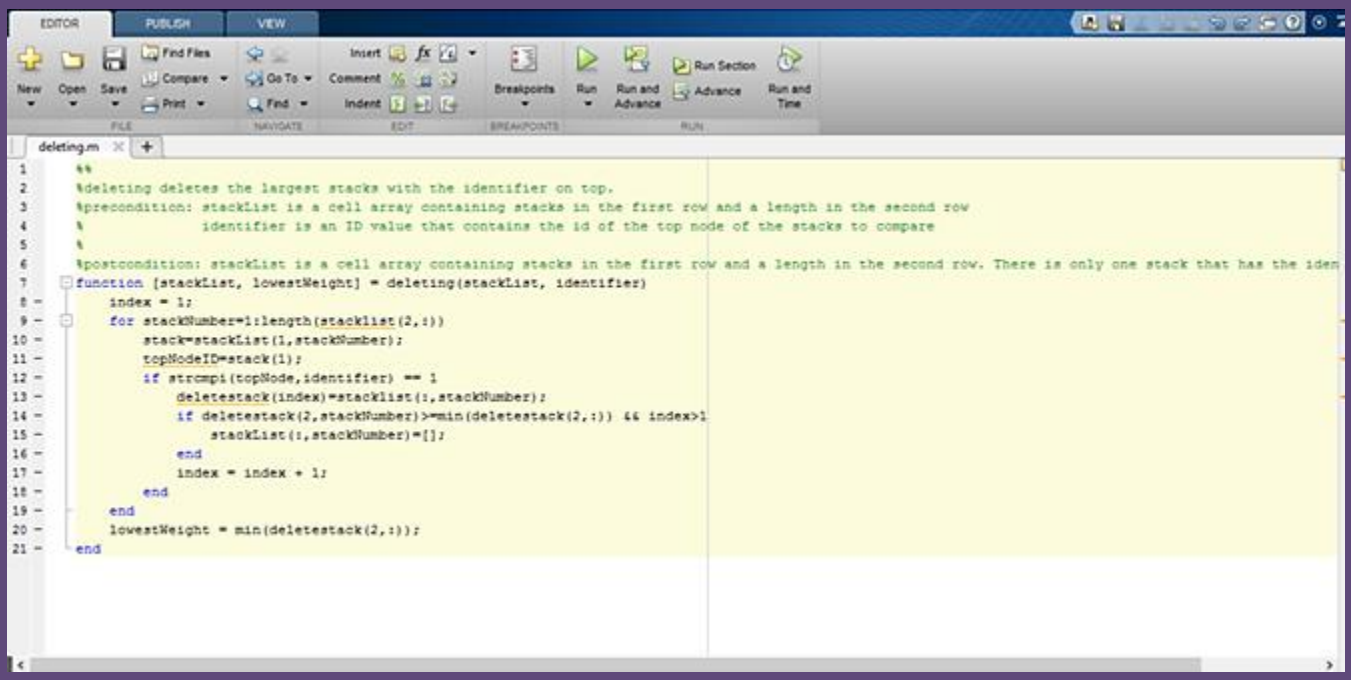
Fall Semester 2016, I was a teaching assistant for the University of Cincinnati Mechanical Engineering Department. I was responsible for attending an Engineering Models 1 lab session in order to help students find errors in their programs and answer questions related to the topics covered in that lab. I also had regular office hours in the Learning Center to help engineering students with any questions they have regarding their courses and assignments.

Engineers Without Borders Implementation Trip, August 2016

Our group had previously installed a water system in Nyambogo, Tanzania that was serving many members of the community, but not enough. In order to make this project self-sustaining, we traveled to Nyambogo for 16 days to lay pipelines to three additional villages and two schoolhouses in order to serve more people. I was also able to interact with the villagers and experience their wonderful culture. My favorite memory from the trip was when we were waiting for one of the tanks to fill with water and the community members all gathered around us, singing and dancing, and thanked us for the work we were doing.

3D-Printing

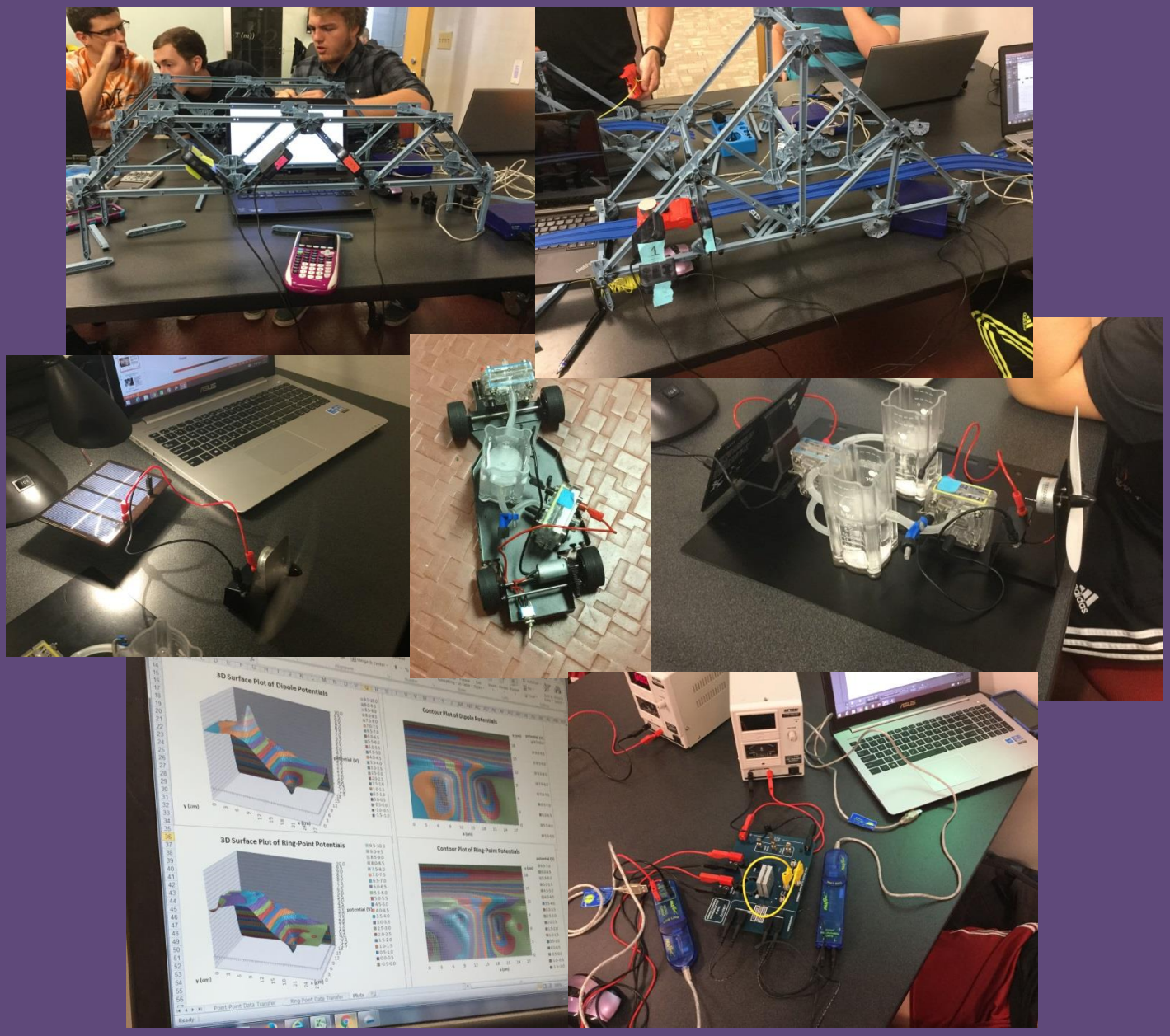
In my free time, I enjoy creating 3D models, using various filaments and finishing techniques. The pictures on this page depict some of the models I have designed and printed.



```
%%
%deleting deletes the largest stacks with the identifier on top.
%precondition: stackList is a cell array containing stacks in the first row and a length in the second row
%              identifier is an ID value that contains the id of the top node of the stacks to compare
%
%postcondition: stackList is a cell array containing stacks in the first row and a length in the second row. There is only one stack that has the iden
function [stackList, lowestWeight] = deleting(stackList, identifier)
    index = 1;
    for stackNumber=1:length(stacklist(2,:))
        stack=stackList(1,stackNumber);
        topNodeID=stack(1);
        if strcmpi(topNode,identifier) == 1
            deletestack(index)=stacklist(:,stackNumber);
            if deletestack(2,stackNumber)>=min(deletestack(2,:)) && index>1
                stackList(:,stackNumber)=[];
            end
            index = index + 1;
        end
    end
    lowestWeight = min(deletestack(2,:));
end
```

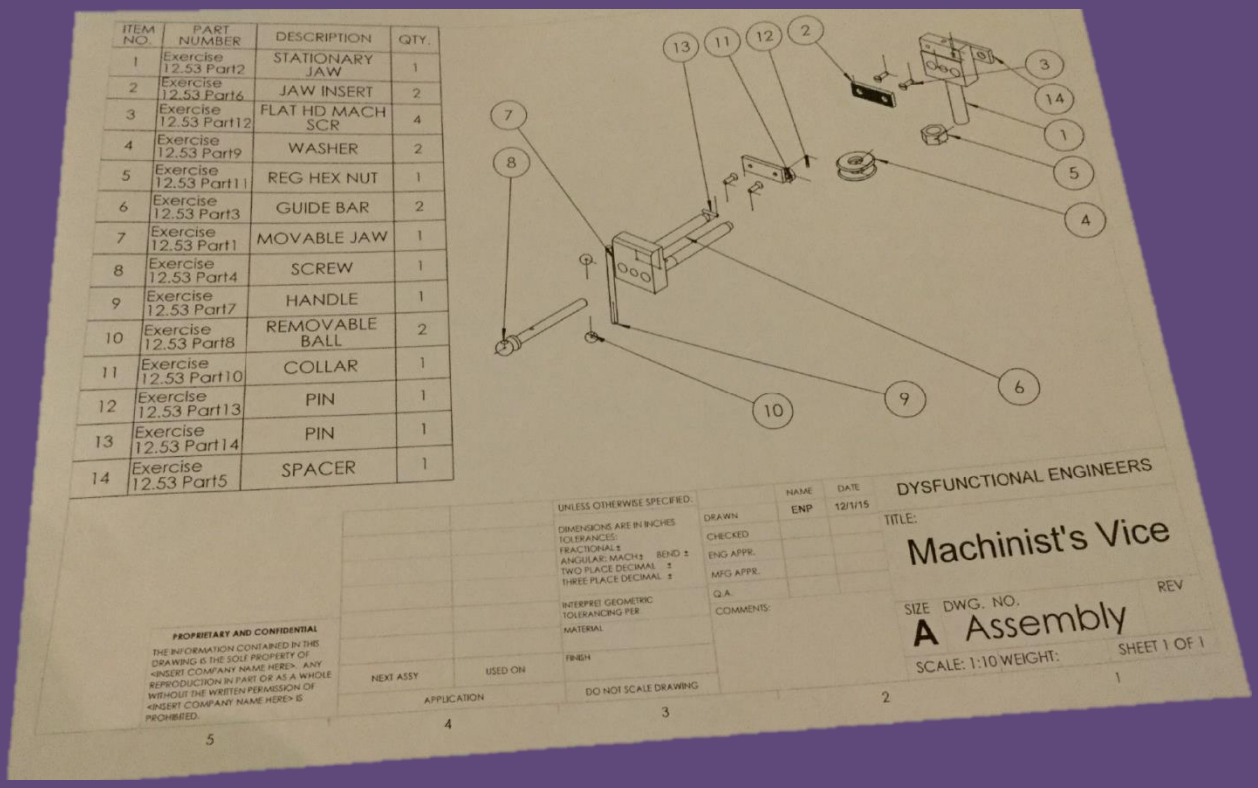
Models Honors Experience

Spring Semester 2016, I was part of an undergraduate Honors Research Group using MATLAB. We researched algorithms to find the shortest walking distance between points on the University of Cincinnati campus. I wrote the function above for Dijkstra's algorithm.



2015/2016 Coursework

The top pictures are bridge designs built to use sensors to test for tension or compression. The middle row are labs using solar power; solar powered fan, solar powered fuel cell in a car, and the fuel cell charged with solar power. Bottom left is a Physics II plot of a dipole. Bottom right is a Peltier device to analyze the flow of energy between electricity and heat.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Exercise 12.53 Part2	STATIONARY JAW	1
2	Exercise 12.53 Part6	JAW INSERT	2
3	Exercise 12.53 Part12	FLAT HD MACH SCR	4
4	Exercise 12.53 Part9	WASHER	2
5	Exercise 12.53 Part11	REG HEX NUT	1
6	Exercise 12.53 Part3	GUIDE BAR	2
7	Exercise 12.53 Part1	MOVABLE JAW	1
8	Exercise 12.53 Part4	SCREW	1
9	Exercise 12.53 Part7	HANDLE	1
10	Exercise 12.53 Part8	REMOVABLE BALL	2
11	Exercise 12.53 Part10	COLLAR	1
12	Exercise 12.53 Part13	PIN	1
13	Exercise 12.53 Part14	PIN	1
14	Exercise 12.53 Part5	SPACER	1

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	ENP	12/1/15
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

DYSFUNCTIONAL ENGINEERS

TITLE: Machinist's Vice

SIZE A DWG. NO. Assembly REV

SCALE: 1:10 WEIGHT: SHEET 1 OF 1

5 4 3 2 1

Engineering Design Graphics

Project using SolidWorks

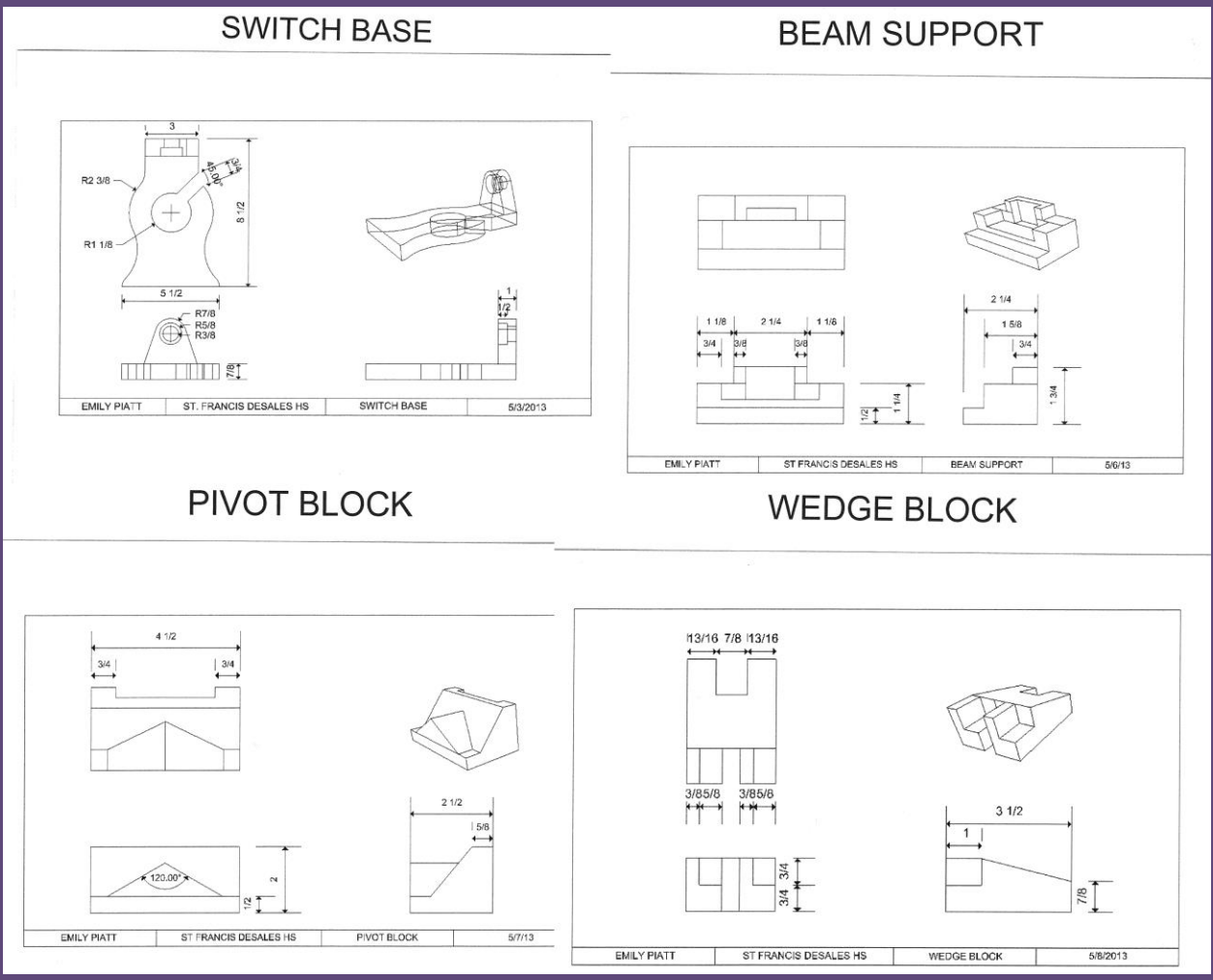
Fall Semester 2015






2014 Lemelson-MIT InvenTeam, DeSales HS

I was the CAD specialist on this team to create a prototype of an Automatic Page Turner for people with limited hand mobility and designed many of the components using Rhino 3D. We worked with a girl at the Heinzerling Foundation who has Cerebral Palsy, but loves to read, in order to customize the project around her needs. The top pictures are presenting our project to MIT staff and a balloon lift challenge at the EurekaFest event. Middle left is the assembly of the page turning buttons, which were designed in Rhino and laser cut. Middle right are the components and Arduino program. Bottom left is the completed prototype and bottom right is our team, along with our inspiration, Lizzy.

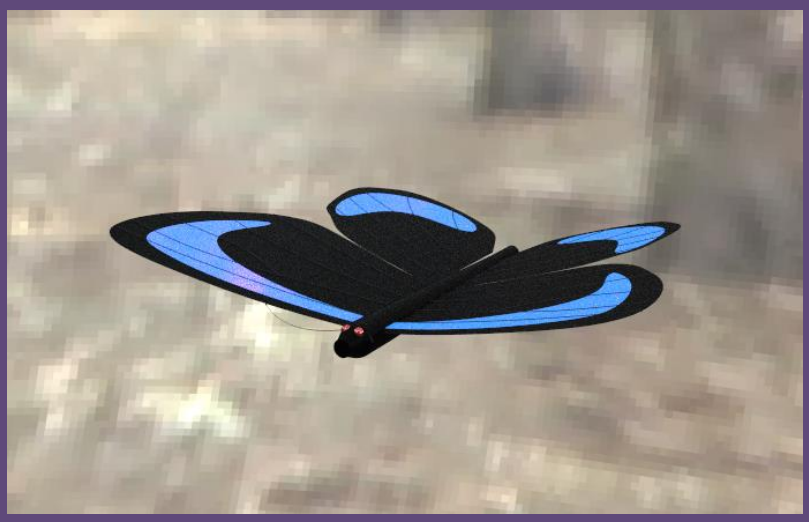


Technical Drawings

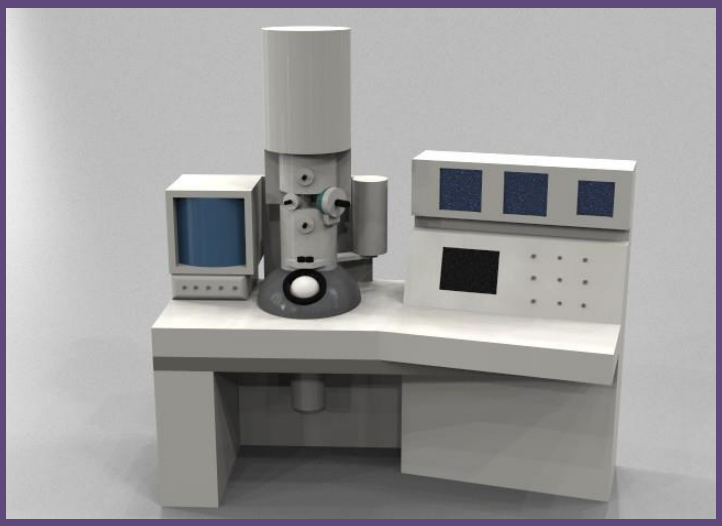
These are technical drawings completed as part of a high school Product Design class in Rhino 3D.

Pen Design

I created this pen beginning with two wood blocks using the lathe. My design incorporated a pleasing visual presentation, as well as a comfortable grip.



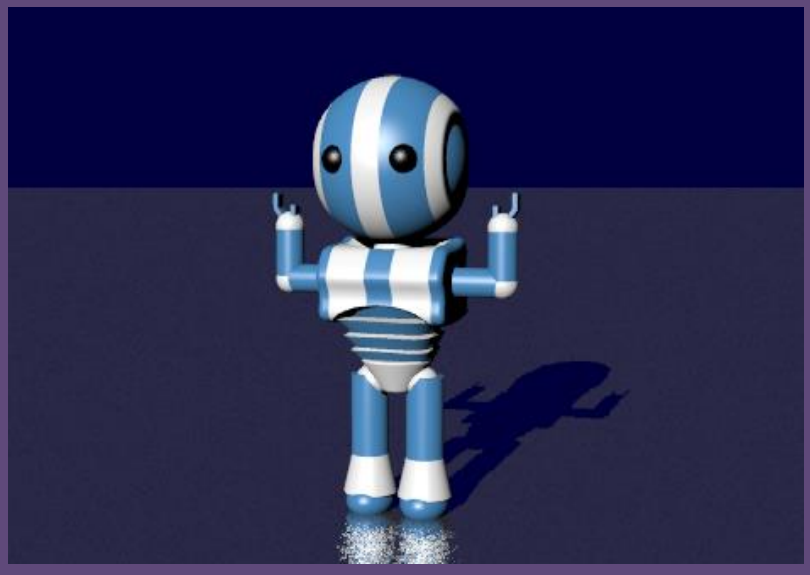
The pictures on the next two pages are a compilation of my favorite projects in my design classes in high school. All of these designs were done using Rhino 3D. In addition to the designs; the butterfly, robot, and radio were also animated.




2015


12
3
6
9

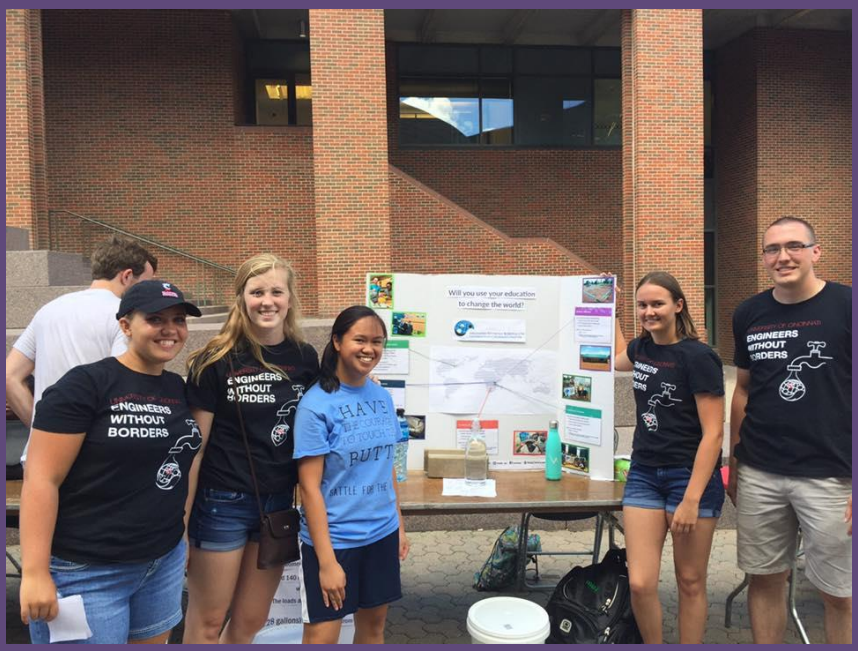

Radio stations
Pop
Hip Hop
News
Now Playing:
ABC By: The Jackson Five



This Keurig was created in Rhino 3D. Then I created a poster of the project in Photoshop to use as an advertisement to entice other students to take the CAD classes at DeSales HS.

Personal Towel Folder

This is a working prototype of a personal towel folder I designed and created for Invention Convention in middle school using Lego Mindstorms gears and programming to move the flaps to fold the towel.



University of Cincinnati Activities

- Engineers Without Borders

(I am part of the Nyambogo Committee to provide clean drinking water for the people of Nyambogo, Tanzania, as well as the EWB Internal Vice-President.)

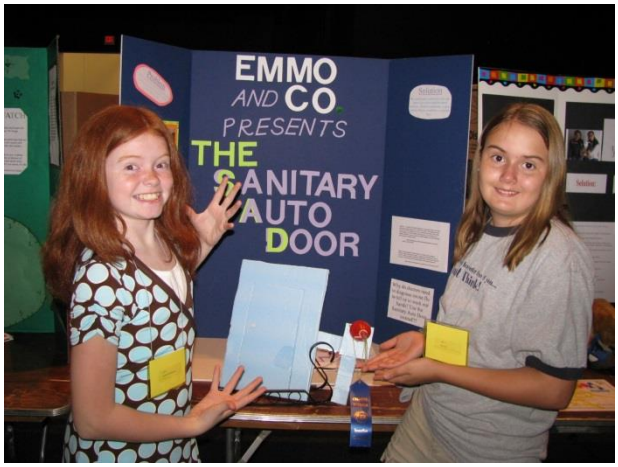
- Society of Women Engineers
- UC Bike Works

(We repair donated bicycles to be given to children in need through the Society of St. Vincent DePaul.)

University of Cincinnati Activities

- UC Club Softball Team
  National Player of the Week
  Conference Pitcher of the Week
- National Society of Leadership & Success
- Alpha Lambda Delta Honor Society
  Membership is open to those who earn a 3.5 or higher and are in the top 20% of their class during their first term or year of college.
- Girl Scouts
  I led a troop of Kindergarten and 1st Graders at North College Hill Elementary School.
  I was a girl member for 13 years.

Girl Scouts®



Early Engineering Projects Middle School

The top left picture is building the Guinness Book of World Records Tallest Cookie Tower with a team of Girl Scouts. Top right is an idea for a door that would only open after the employee washed their hands. Middle left is working with Meacham and Apel Architects on our Cookie Tower design. Middle right is during a Lego Mindstorms competition. The bottom photo is my first working prototype: a revolving spider web remover.