



EMILY
PIATT

ENGINEERING DESIGN PORTFOLIO

University of Cincinnati, Mechanical Engineering
Mathematics Minor
Cincinnatus Scholar

Class of 2019

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Imaging Engineering Co-op, Kinetic Vision

On my third and fourth Co-op rotations, I worked at Kinetic Vision in Cincinnati, Ohio as an Imaging Engineering Co-op. In this position, I performed various analyses for parts that had been scanned with a CT scanner, including first article inspection, 3-D metrology, reverse engineering, wall thickness analysis, and failure analysis. I was also able to create reports for each of my projects. The most important technical skill that I learned at Kinetic Vision was how to write an effective report. This was important for me to learn because as an engineer I need to be able to communicate my ideas and results effectively to others. One non-technical concept that I learned during this co-op was how important it is to have a positive work environment. The work at Kinetic Vision is very fast paced and can be stressful at times, but all of the full-time employees are able to enjoy what they do and be proud of where they work because of the company culture. The whole company feels like one big family and experiencing this has shown me how important it is to find a work environment that encourages you to learn and pushes you to do your best work.



Engineers Without Borders Implementation Trip, March 2018

There was an existing well in the community, but not many people used it because it was in a remote location that flooded often. During the trip we installed pipelines, tanks, and tap stands so that the water could be pumped to the school on the top of the hill. This experience helped me to learn just how important teamwork is. We would not have been able to finish the project without the help of all of the community members. Everyone was willing to do their part because they knew this project would benefit everyone in the community. I am so glad that I was able to be part of this trip because, since it was my second implementation trip, I was able to participate more in the process. On my first trip I was given instructions and followed them the best I could, but on this trip I was able to lead an implementation team and had to make decisions about the project. This trip was a great opportunity for me to develop my leadership skills and to learn how to better communicate with people from other cultures.



Habitat for Humanity Collegiate Challenge, December 2017

This challenge allowed me to learn more about Habitat for Humanity and also go out into the community and help improve housing. The first day we were there, we worked in the Habitat for Humanity Restore. The next day we were sent to a home restoration. The homeowner had a leaky roof and a porch that had serious termite damage. Throughout the week we worked with the owner to make sure their house was safe and leak free for the winter.



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.



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.



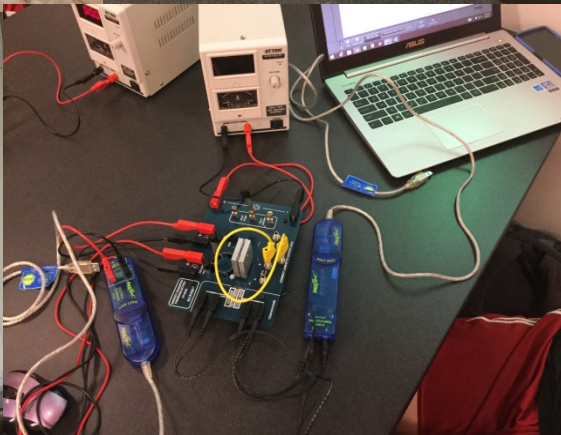
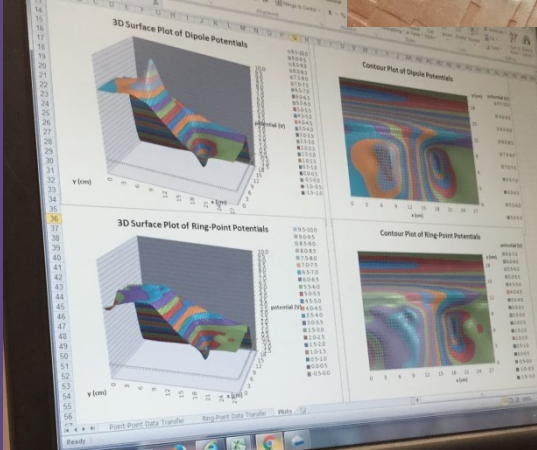
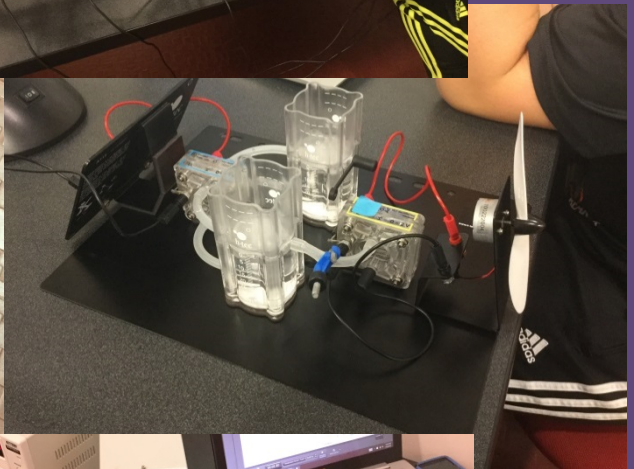
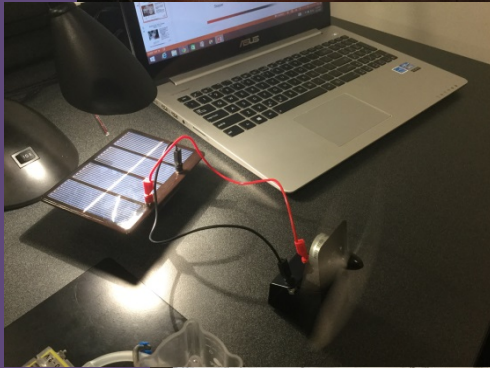
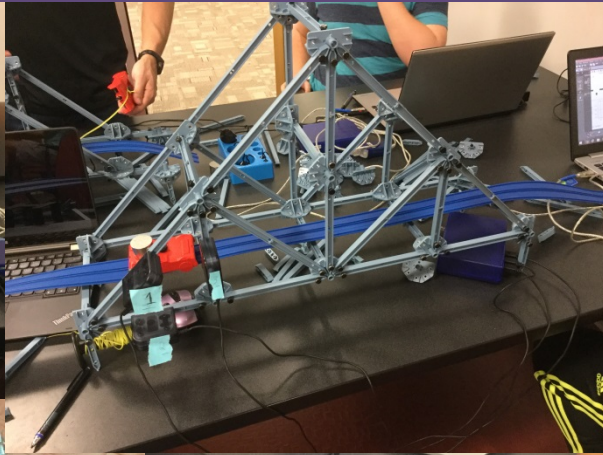
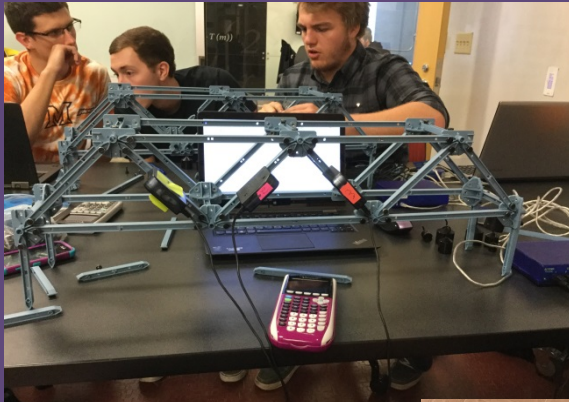
Engineering Models Teaching Assistant

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.

```
1  %deleting deletes the largest stacks with the identifier on top.
2  %precondition: stackList is a cell array containing stacks in the first row and a length in the second row
3  %               identifier is an ID value that contains the id of the top node of the stacks to compare
4  %
5  %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
6  function [stackList, lowestWeight] = deleting(stackList, identifier)
7
8     index = 1;
9     for stackNumber=1:length(stackList(2,:))
10        stack=stackList(1,stackNumber);
11        topNodeID=stack(1);
12        if strcmpi(topNode,identifier) == 1
13            deletestack(index)=stackList(:,stackNumber);
14            if deletestack(2,stackNumber)>=min(deletestack(2,:)) && index>1
15                stackList(:,stackNumber)=[];
16            end
17            index = index + 1;
18        end
19    end
20    lowestWeight = min(deletestack(2,:));
21 end
```

Models Honors Experience

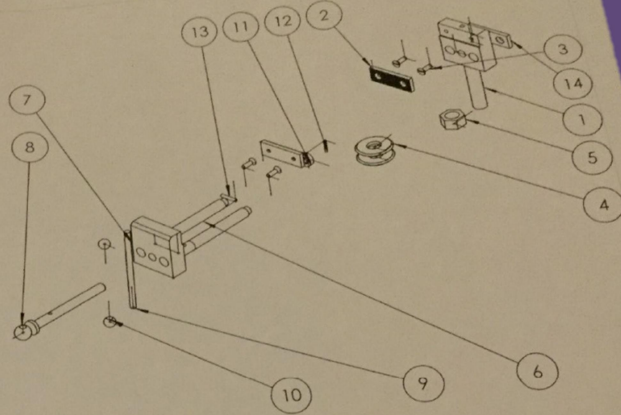
Spring Semester 2016, I was part of an undergraduate Honors Research Group using MATLAB. We researched algorithms to find the shortest walking distance between points on the University of Cincinnati campus. I wrote the function above for Dijkstra's algorithm.



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:		NAME	DATE	DYSFUNCTIONAL ENGINEERS
DIMENSIONS ARE IN INCHES		ENP	12/1/15	
TOLERANCES:		DRAWN		TITLE:
FRACTIONAL ±		CHECKED		Machinist's Vice
ANGULAR ± MACH ±		ENG APPR.		SIZE DWG. NO.
TWO PLACE DECIMAL ±		MFG APPR.		A Assembly
THREE PLACE DECIMAL ±		G.A.		SCALE: 1:10 WEIGHT:
INTERPRET GEOMETRIC TOLERANCING PER MATERIAL		COMMENTS:		REV
FINISH				SHEET 1 OF 1
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			

Engineering Design Graphics

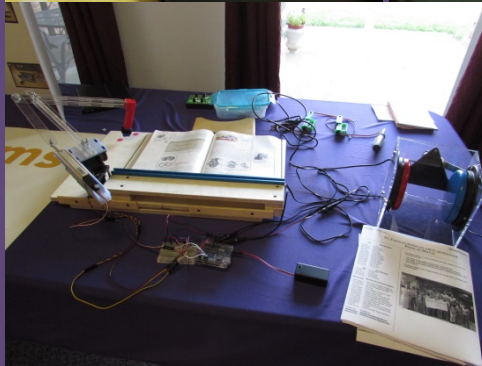
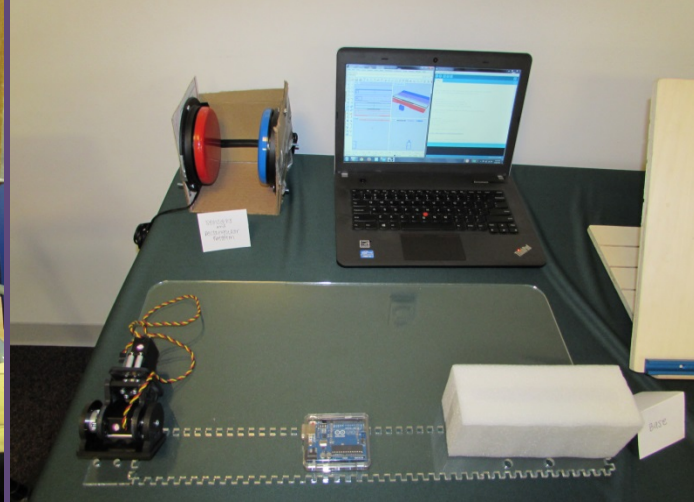
Project using SolidWorks

Fall Semester 2015



3D-Printing

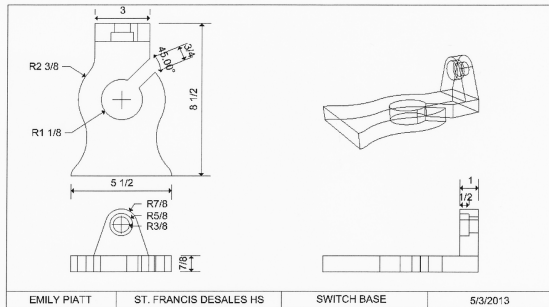
In my free time, I enjoy creating 3D models, using various filaments and finishing techniques. The pictures on this page depict some of the models I have designed and printed.



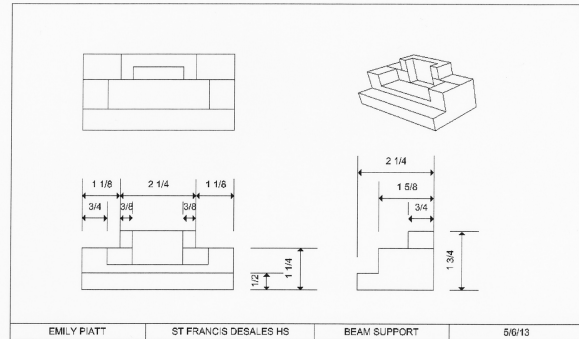
2014 Lemelson-MIT InvenTeam, DeSales HS

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.

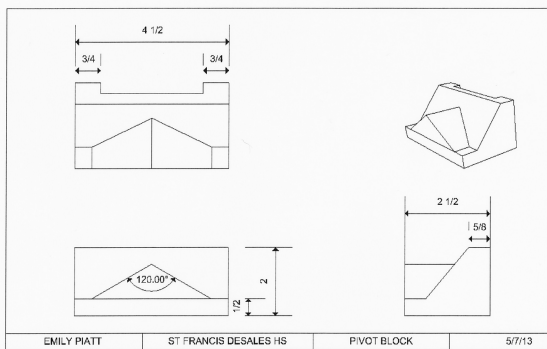
SWITCH BASE



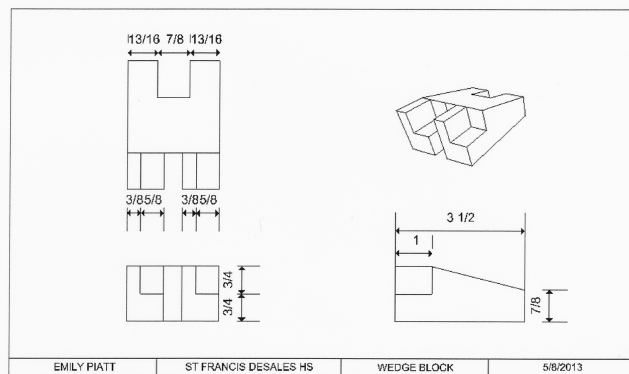
BEAM SUPPORT



PIVOT BLOCK



WEDGE BLOCK



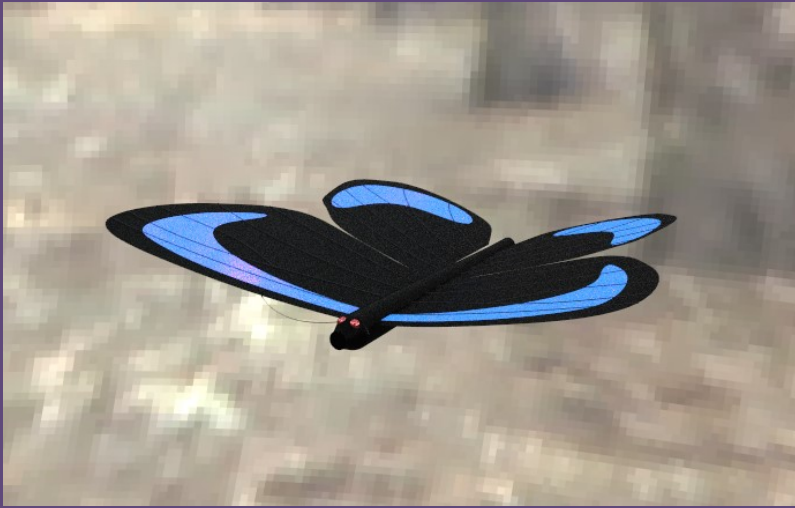
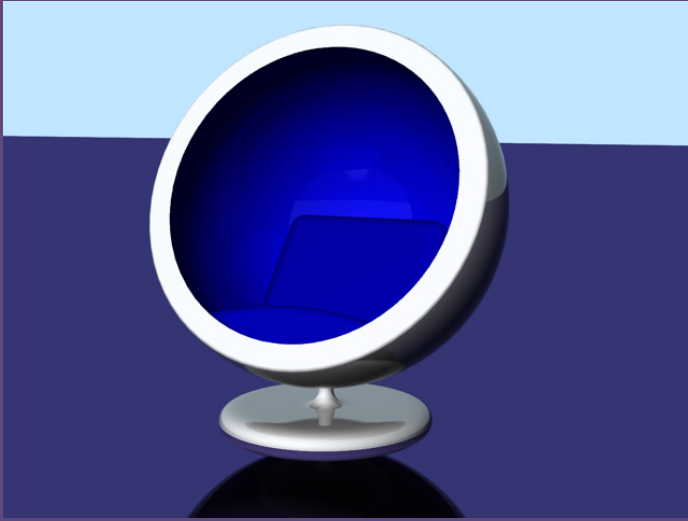
Technical Drawings

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

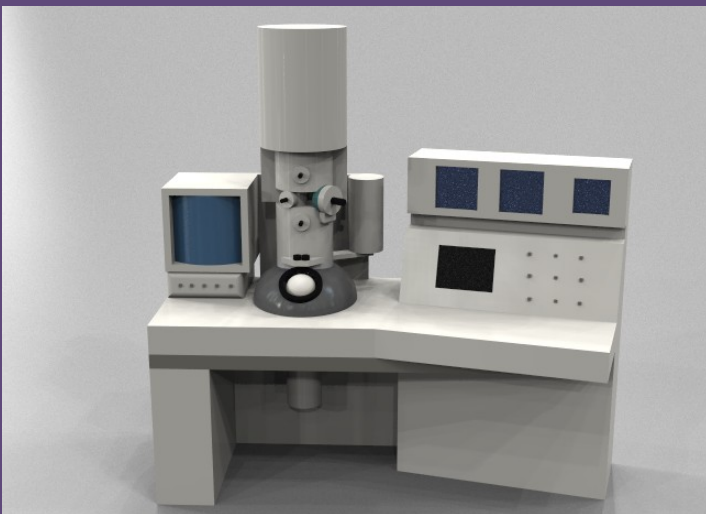


Pen Design

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.





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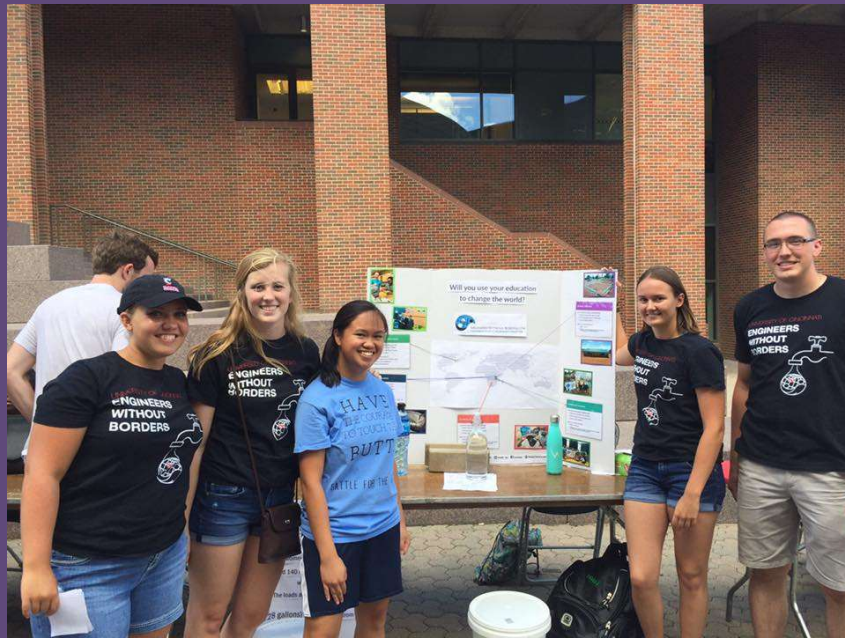
PRODUCT DESIGN

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 have worked as part of the Nyambogo Committee, to provide clean drinking water for the people of Nyambogo, Tanzania, as well as served as the Historian and Internal Vice-president in charge of international projects. I also participated on a Habitat for Humanity Collegiate Challenge.)
- Society of Women Engineers



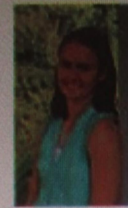


University of Cincinnati Activities

- UC Club Softball Team
President and Coach (2017-2019)
2nd Team All-American (2018)
National Pitcher of the Week (2018)
National Player of the Week (2016)
- National Society of Leadership & Success
- Alpha Lambda Delta Honor Society
- Tau Beta Pi (Engineering Honor Society)
- Pi Tau Sigma (Mechanical Engineering Honor Society)
- Girl Scouts
I led a troop of Kindergarten and 1st Graders and was a girl member for 13 years.



Player of the Week



Emily Piatt P/UT

Cincinnati

Piatt was huge for Cincinnati this past weekend. Playing in all three games against Louisville, she went 4 for 9 with three doubles & a homerun. She also drove in two RBI's & touched home seven times.

Pitcher of the Week



Emily Piatt P/UT

Cincinnati

In addition to her player of the week stats, Piatt pitched in two games & walked away with a PERFECT GAME in Game 3 which ended in a 3-inning slaughter-rule. In two games she delivered 11 K's & no BB.

