UMassAmherst

Senior Design Project – SDP18

Introduction

7 September 2017

C.V. Hollot
Professor and Head

Baird Soules
Sr. Lecturer and Director of Experiential Learning

SDP18 Clock ~~Starts~~ Ticking

SDP18 Demo Day

27th-28th April 2018

~~**393 days**~~

~~**372 days**~~

232 days

Students OWN SDP18

CSE 14-18

_____ , _____ Date: _____

Last Name *First Name*

Curriculum Worksheet for the Computer Systems Engineering Classes of 2014 through 2018

First Year		Second Year		Third Year		Fourth Year	
Fall [15cr]	Spring [16cr]	Fall [18-19cr]	Spring [19cr]	Fall [15cr]	Spring [15cr]	Fall [12-14cr]	Spring [13-15cr]
ENGIN 112 Intro. to ECE [3 cr] [Note 1]	CMPSCI 121 Intro. Problem Solving w/Comp (Java) [4 cr]	ECE 211 Circuit Analysis I [4 cr]	ECE 212 Circuit Analysis II [4 cr]	ECE 313 Signals & Systems [4 cr]	ECE 314 Intro. Prob. & Random Procs. [4 cr]	ECE 415 Senior Design Project I [3 cr] (GenEd-IE)	ECE 416 Senior Design Project II [3 cr]
PHYSICS 151 Gen. Physics I – Mechanics [4 cr]	PHYSICS 152 Gen. Physics II – Thermo., E&M [4 cr]	ECE 242 Data Structures & Algorithms (w/Java) [4 cr]	ECE 232 Hardware Organization & Design [4 cr]	ECE 323 Electronics I [4 cr]	ECE 374 Computer Networks & the Internet [3 cr]	CSE [3 or 4 cr] [Note 6]	CSE [3 or 4 cr] [Note 6]
MATH 131 Calculus I [4 cr]	MATH 132 Calculus II [4 cr]	MATH 331 Differential Equations [3 cr]	MATH 235 Linear Algebra [3 cr]	ECE 353 Computer Systems Lab I [3 cr]	ECE 354 Computer Systems Lab II [4 cr]	CSE Elective [3 or 4 cr] [Note 6]	CSE Elective [3 or 4 cr] [Note 6]
Social World Elective [4 cr] [Note 2]	ENGLWRIT 112 College Writing [3cr]	Social World Elective [4 cr] [Note 2]	CMPSCI 250 Intro. Computaton [4 cr]	ECE 373 Software Intensive Engineering [4 cr]	ECE 303 Junior Seminar [1 cr]	Social World Elective [4 cr] [Note 2]	Social World Elective [4 cr] [Note 2]
		Thematic Elective [3 or 4 cr] [Note 3]	BIOLOGY 110 [4 cr] [Note 5]		ENGIN 351 Writing in Engineering [3 cr]		
		(Take ECE 221, Digital Systems, unless ENGIN 112 was taken in Fall 2014 or earlier. [4 cr] [Note 4])				5-yr B.S. / M.S. Graduate Course [3 or 4 cr] (Cannot be used for B.S. degree) [Note 7]	5-yr B.S. / M.S. Graduate Course [3 or 4 cr] (Cannot be used for B.S. degree) [Note 7]

The curriculum notes can be found on the reverse side of this worksheet.

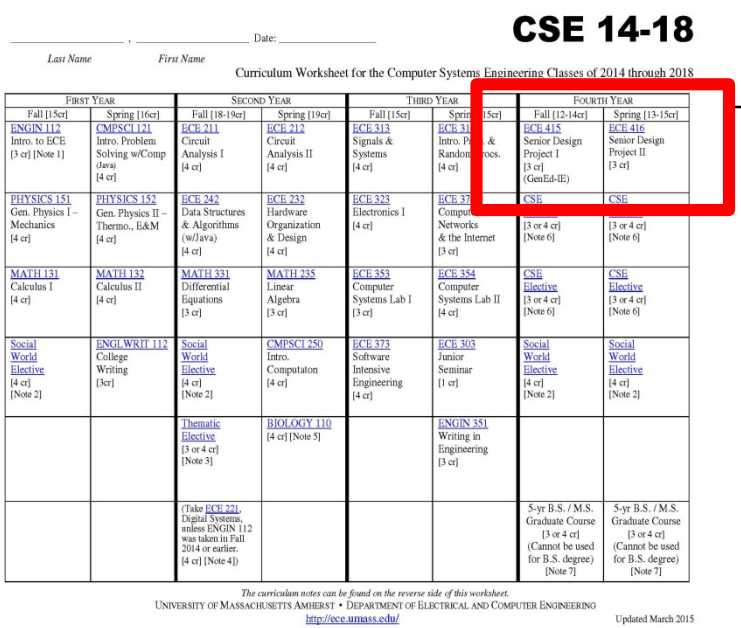
University of Massachusetts Amherst • Department of Electrical and Computer Engineering

http://ece.umass.edu/

Updated March 2015

Students Empowered

- Select your own team
- Select your own project
- Select your own advisor
- **Empowerment**
- **Responsibility**



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Last Name *First Name*

CSE 14-18

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Updated March 2015

Course attributes

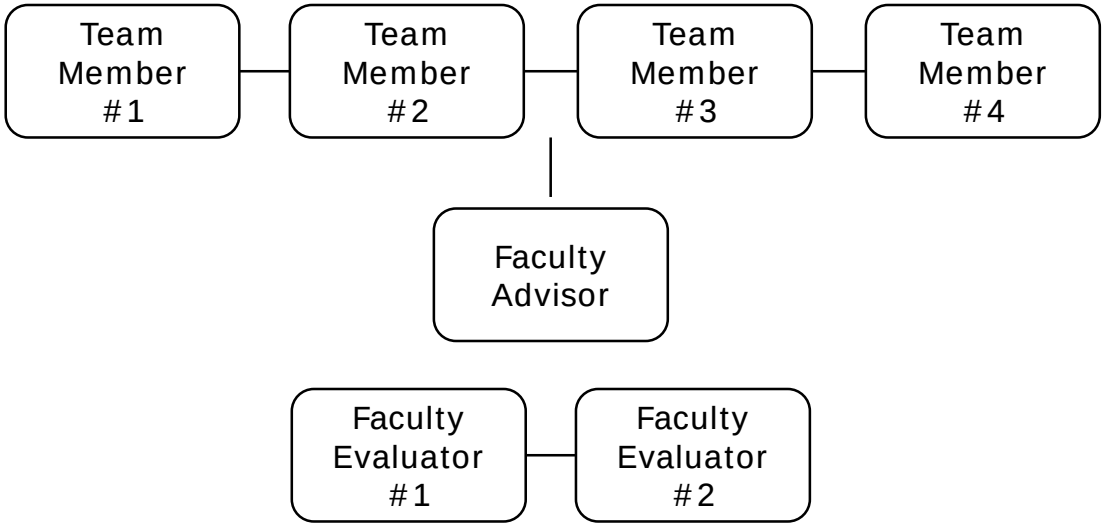
- Idea → prototype (year-long hackathon)
- Ideas self-generated
- Teams self-form
- Self-learning opportunities
- **Teaming experience**
- Impact on society
- Pre-professional experience in engineering design
- **Minimal classroom interactions**
  - **Weekly team / advisor meetings**
  - **Reviews before faculty evaluators**

Takes a Department to do SDP

COO

CTO

CLT

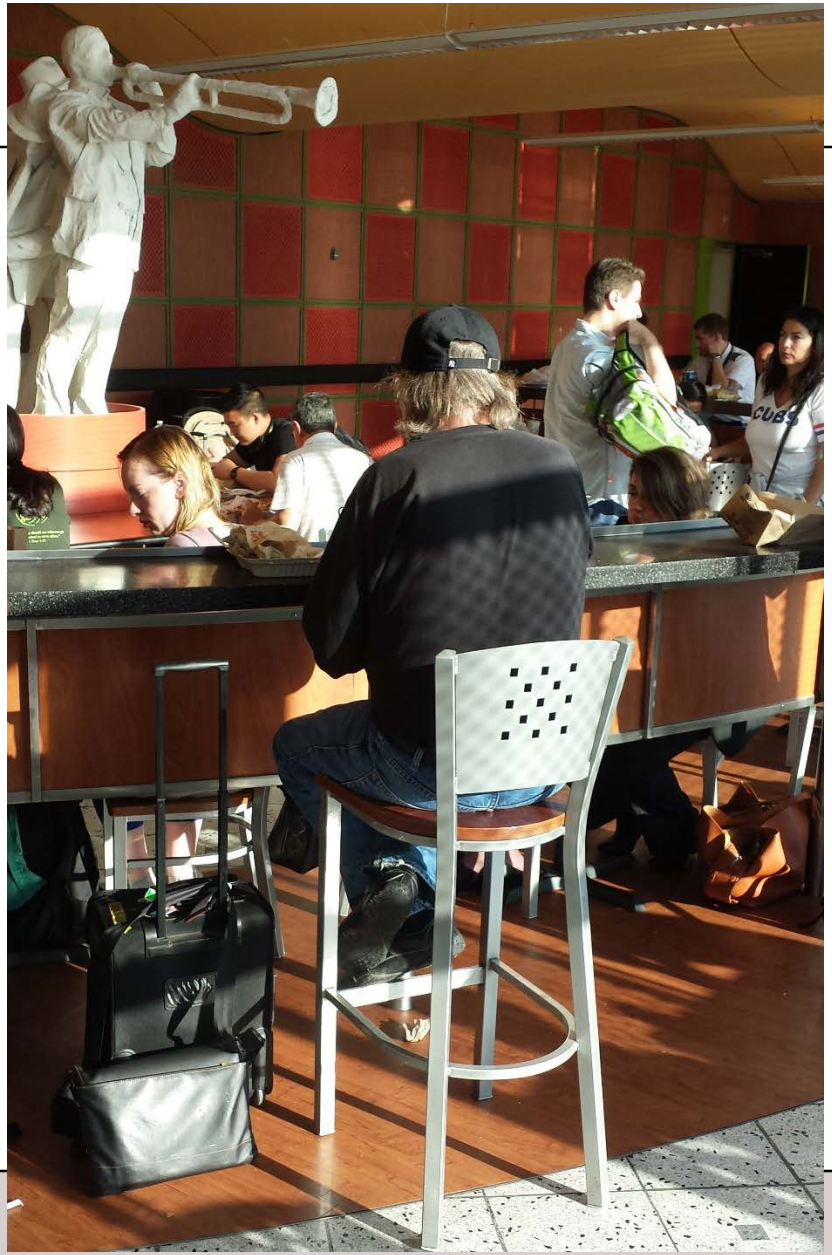


Fran Caron

Marcus Hall, Room 9A

Baird Soules

M5, Room 5J


CUBS

SDP18 Reviews (the drumbeat)

Making the Pitch

Preliminary Design Review (PDR) **Oct**

Demonstrating the Essence

Midway Design Review (MDR) **Nov**

Working Prototype

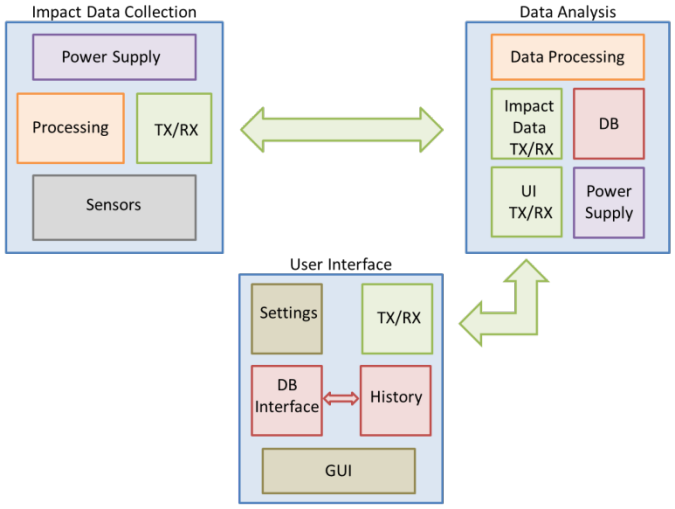
Comprehensive Design Review (CDR) **Feb**

THE Prototype

Final Project Review (FPR) **April**

→ SDP Demo Days **27th, 28th April**

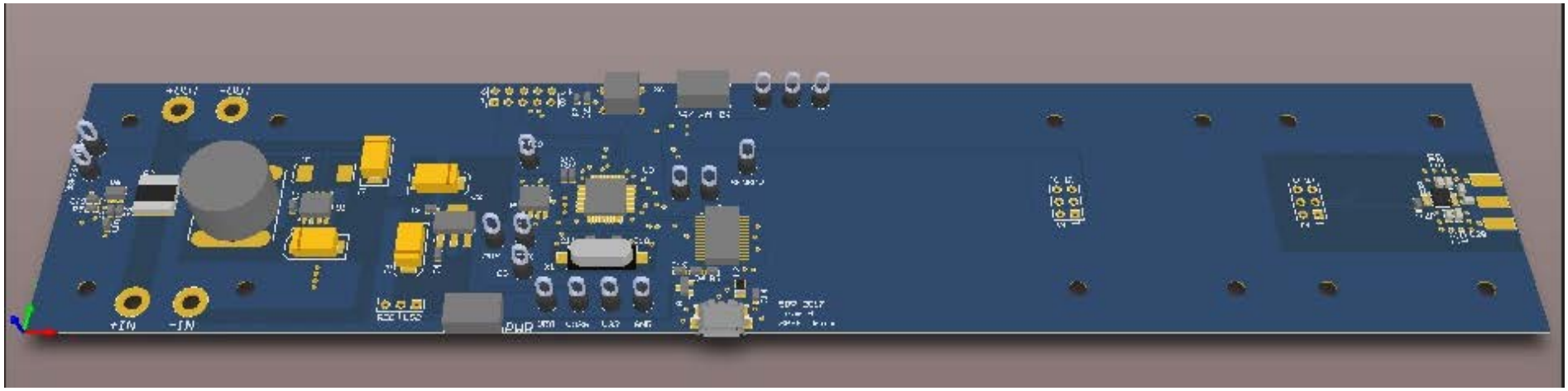
Block Diagram



SDP18 Course Deliverables

- Project Website
- Review Presentations
  (PDR/MDR/CDR/FPR slide decks)
- Written report
- Demo Poster
- System Prototype

Must include custom PCB



Examples

- 8-bit microcontroller
- sensor board (signal conditioning, intelligence)
- actuator board (power stage)
- power supply

SDP18 Process

- Teams of 4 students
  - Choose one team manager
- Advisor
  - Each team chooses its own ECE faculty advisor
- Meetings
  - Weekly team meetings
  - Weekly advisor meetings
  - Course meetings
- Project budget: $500
  - Some parts available in SDP lab or M5
  - We encourage students to secure outside support; e.g., free samples, sponsorships, competitions, … .

Review and Grading Process

- Reviews (PDR, MDR, CDR, FPR)
  - Two ECE faculty evaluators (different from advisor)
  - 20/30 min presentation by team + 20 min Q&A

- The final grade for ECE 415 (and ECE 416):
  - Advisor grade (50%): Given at the discretion of the advisor
  - Review Board grade (30%): Average of review panel grades
  - Course Coordinator grade (20%): Based on project documents and performance
  - Each team member graded individually.

SDP18 website http://www.ecs.umass.edu/ece/sdp/sdp18/

http://www.ecs.umass.edu/ece/sdp/sdpxx/

Honorable Mention

SAFE Drone

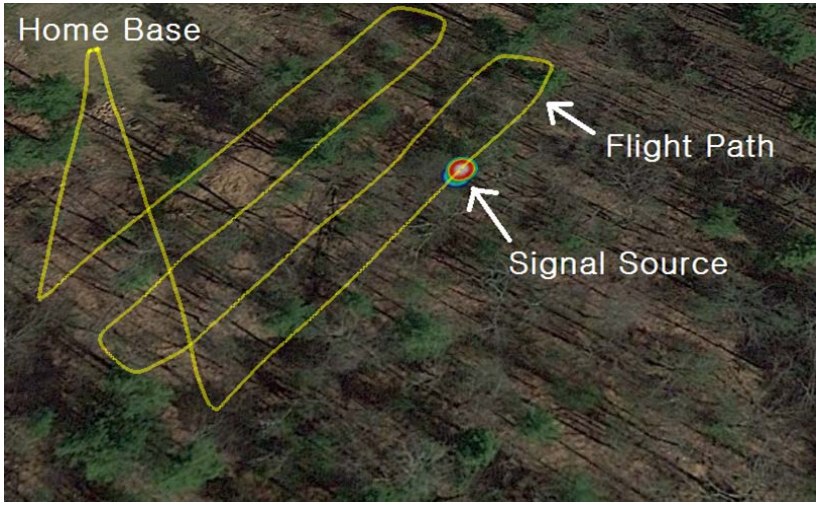


Bradley Marszalkowski, Jamie Kline & Serena Thomas

Advisor: Bill Leonard

Honorable Mention

SAFE Drone



Honorable Mention

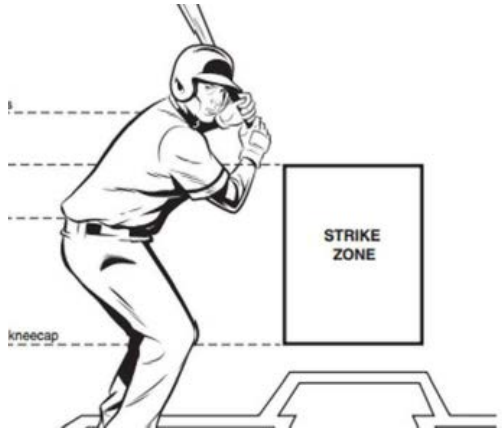
AutoUmp



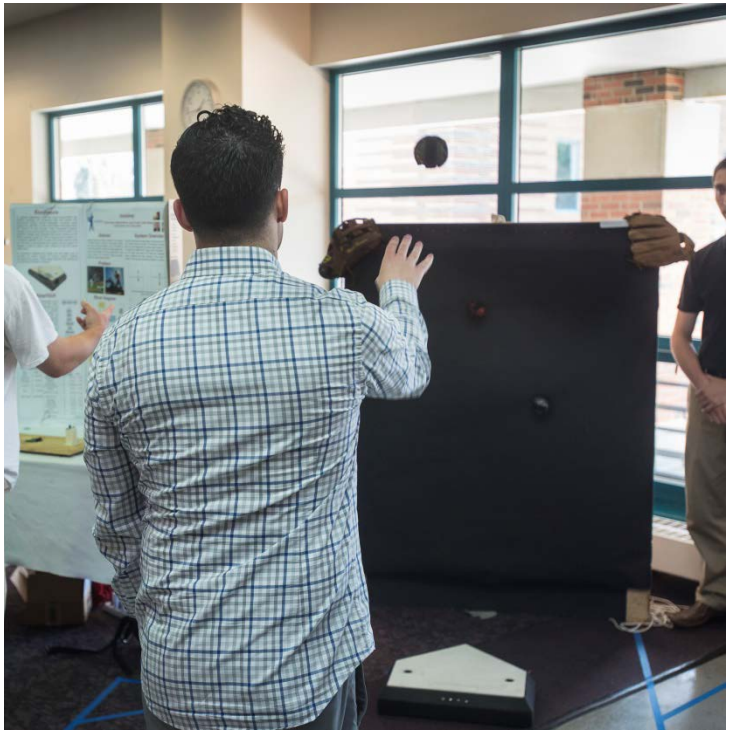

Tim Adams, Justin Marple,
Jason Camiel & Matt Barnes

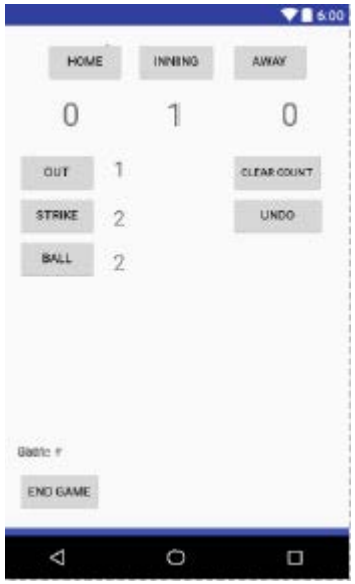
Advisor: Tilman Wolf

Honorable Mention



AutoUmp





SDP17 Third Place

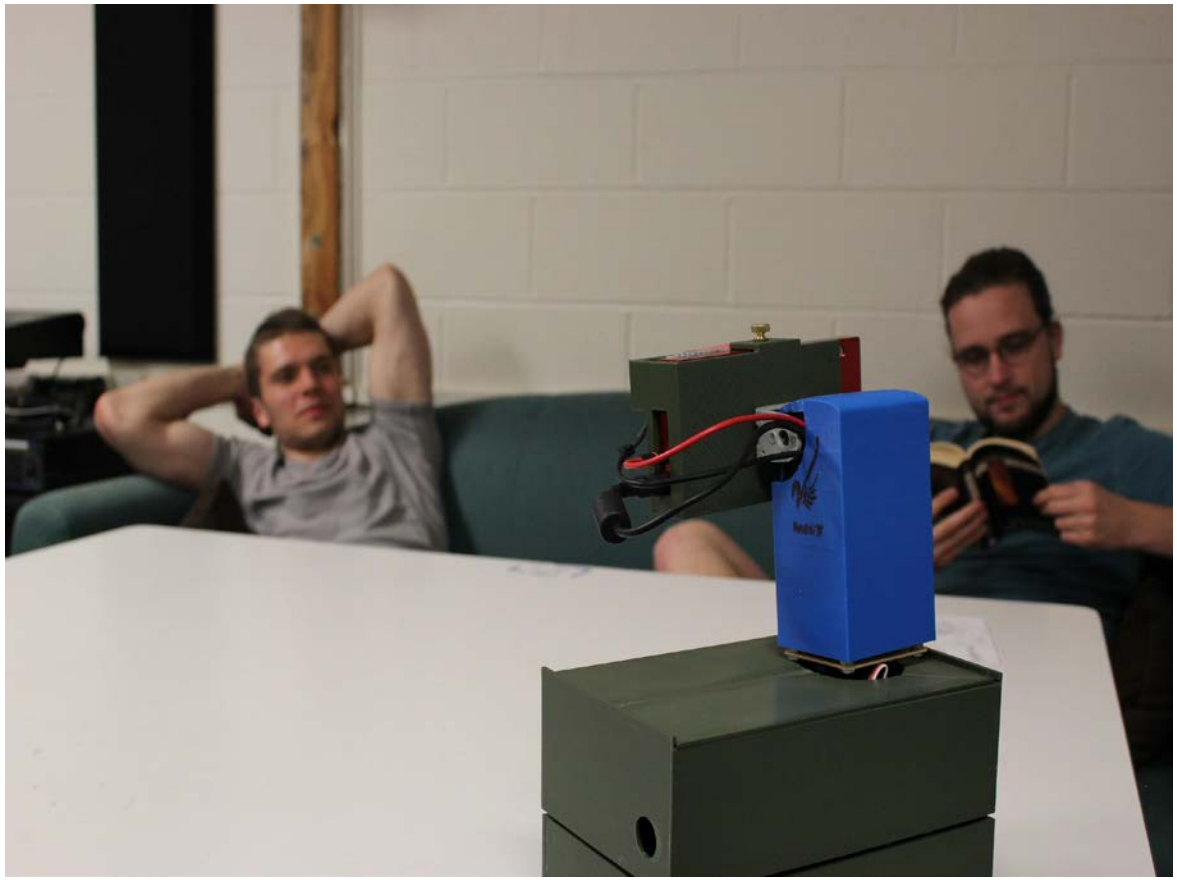
Pegasus-21

Trevor Berry, Istvan Kreiz & Keith Miller

Advisor: Zlatan Aksamija

SDP17 Third Place

Pegasus-21



SDP17 Second Place

Smart Hydroponic Greenhouse

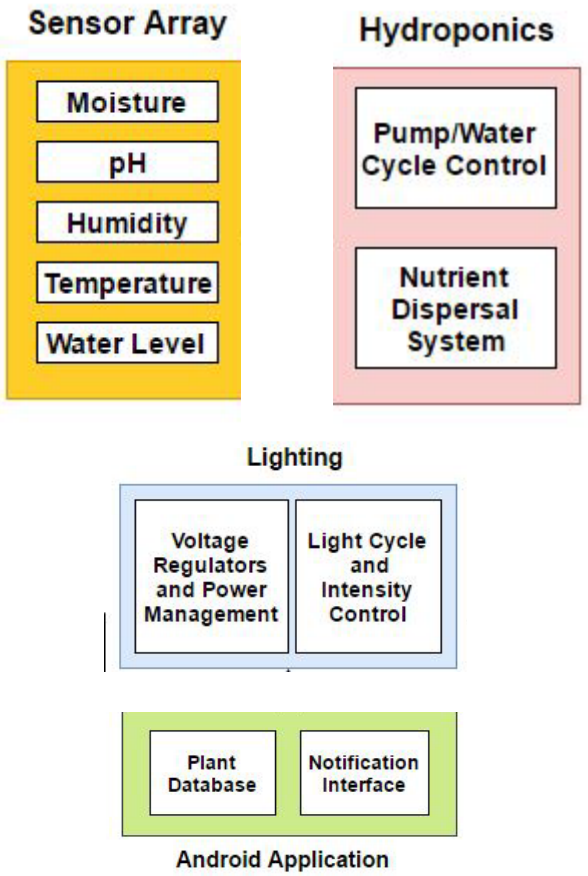



Michael D'Anna, Samantha De Groot, Maxwell Joyce & Shaun Palmer

Advisor: Bob Jackson

SDP17 Second Place

Smart Hydroponic Greenhouse



SDP17 First Place

Step

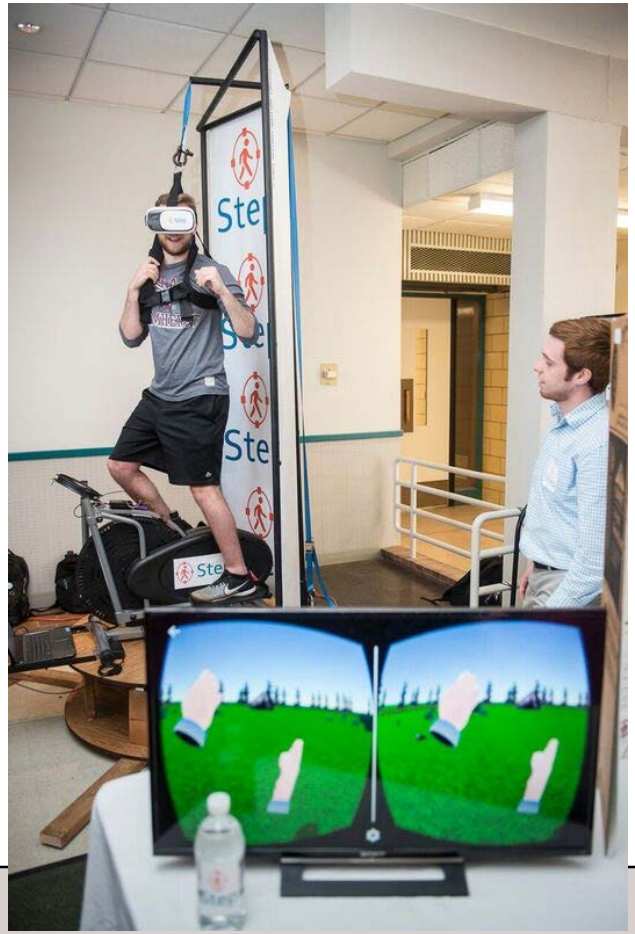



Joseph Roberts, Ryan Daly, Jared Ricci & Steven So

Advisor: Dennis Goeckel

SDP17 First Place

Step

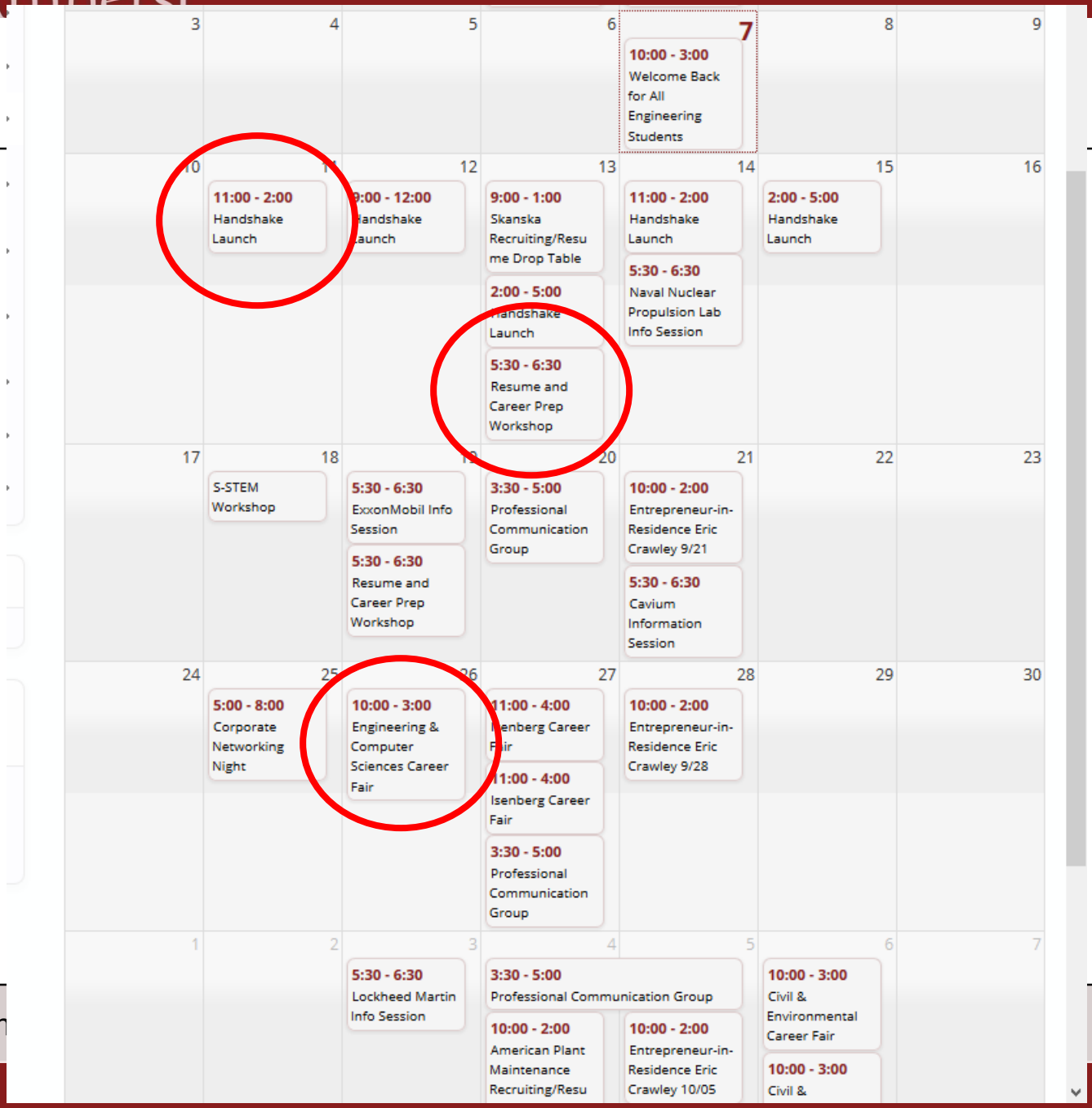


Assignment

- Converge on project (ok to consult with adviser)
- Reserve lab bench, Monday, 11th Sept'17
- Confirm faculty adviser by Tuesday, 19th September'17

Career planning

- Engineering Career Development and Experiential Learning Center (Cheryl Brooks), Marston 112
  - Walk-in resume/cover letter help
  - Mock interviews (by appointment)



3	4	5	6	7	8	9
				10:00 - 3:00 Welcome Back for All Engineering Students		
10	11	12	13	14	15	16
	11:00 - 2:00 Handshake Launch	9:00 - 12:00 Handshake Launch	9:00 - 1:00 Skanska Recruiting/Resume Drop Table 2:00 - 5:00 Handshake Launch 5:30 - 6:30 Resume and Career Prep Workshop	11:00 - 2:00 Handshake Launch 5:30 - 6:30 Naval Nuclear Propulsion Lab Info Session	2:00 - 5:00 Handshake Launch	
17	18	19	20	21	22	23
	S-STEM Workshop	5:30 - 6:30 ExxonMobil Info Session 5:30 - 6:30 Resume and Career Prep Workshop	3:30 - 5:00 Professional Communication Group	10:00 - 2:00 Entrepreneur-in-Residence Eric Crawley 9/21 5:30 - 6:30 Cavium Information Session		
24	25	26	27	28	29	30
	5:00 - 8:00 Corporate Networking Night	10:00 - 3:00 Engineering & Computer Sciences Career Fair	11:00 - 4:00 Isenberg Career Fair 11:00 - 4:00 Isenberg Career Fair 3:30 - 5:00 Professional Communication Group	10:00 - 2:00 Entrepreneur-in-Residence Eric Crawley 9/28		
1	2	3	4	5	6	7
		5:30 - 6:30 Lockheed Martin Info Session	3:30 - 5:00 Professional Communication Group 10:00 - 2:00 American Plant Maintenance Recruiting/Resu	10:00 - 2:00 Entrepreneur-in-Residence Eric Crawley 10/05	10:00 - 3:00 Civil & Environmental Career Fair 10:00 - 3:00 Civil &	

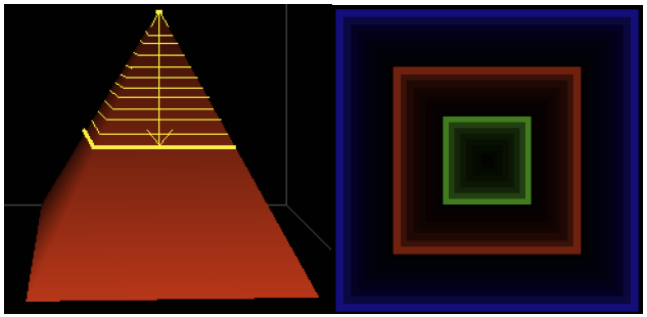

MARCUS HALL
ECE Senior Design Project

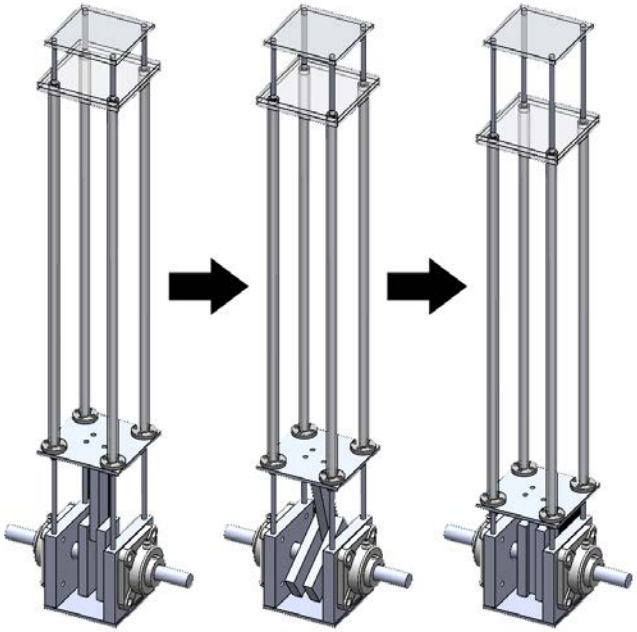
Projects

- What do you want to learn?
- Choose an area – become an expert
- Explore past SDP projects
  - UMass
  - Other ECE departments
- SDP projects are:
  - differentiators at job interviews
  - not PhD dissertations

Real-Time Concussion Analyzer (SDP13)

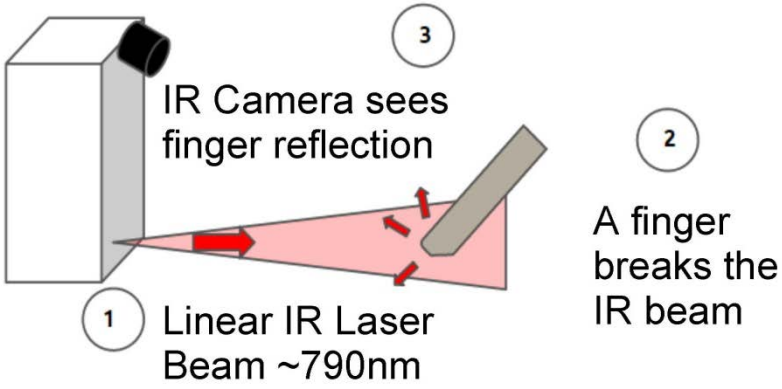
Hologram Machine (SDP14)

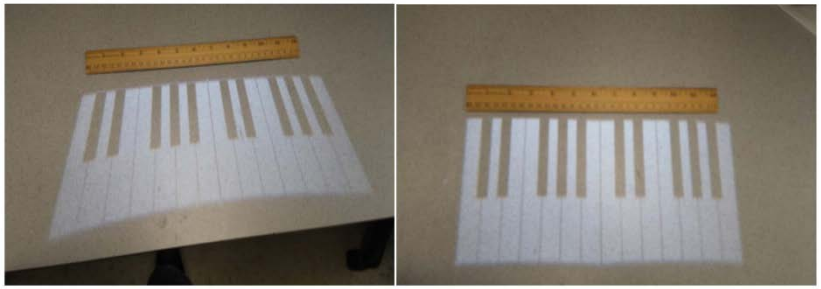




Viano (SDP15)

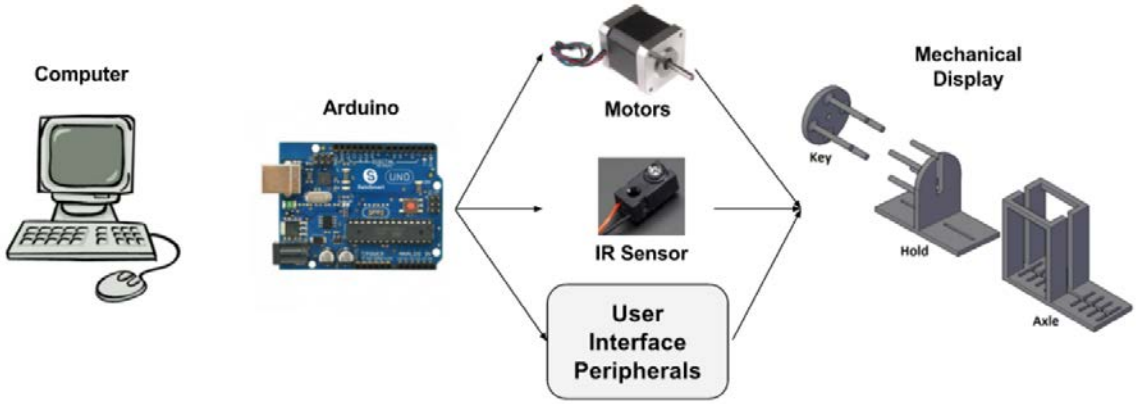
Finger Tracking



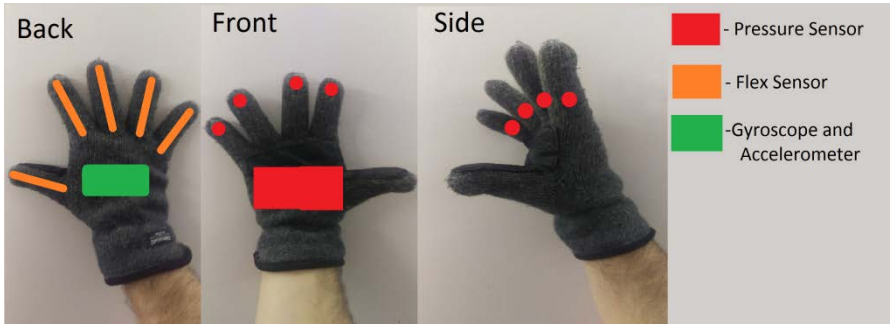


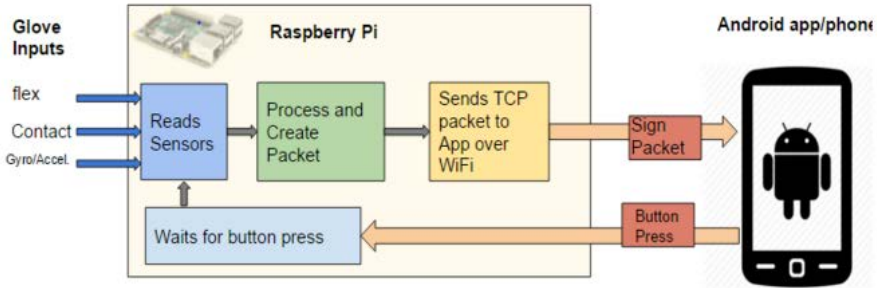
Before After

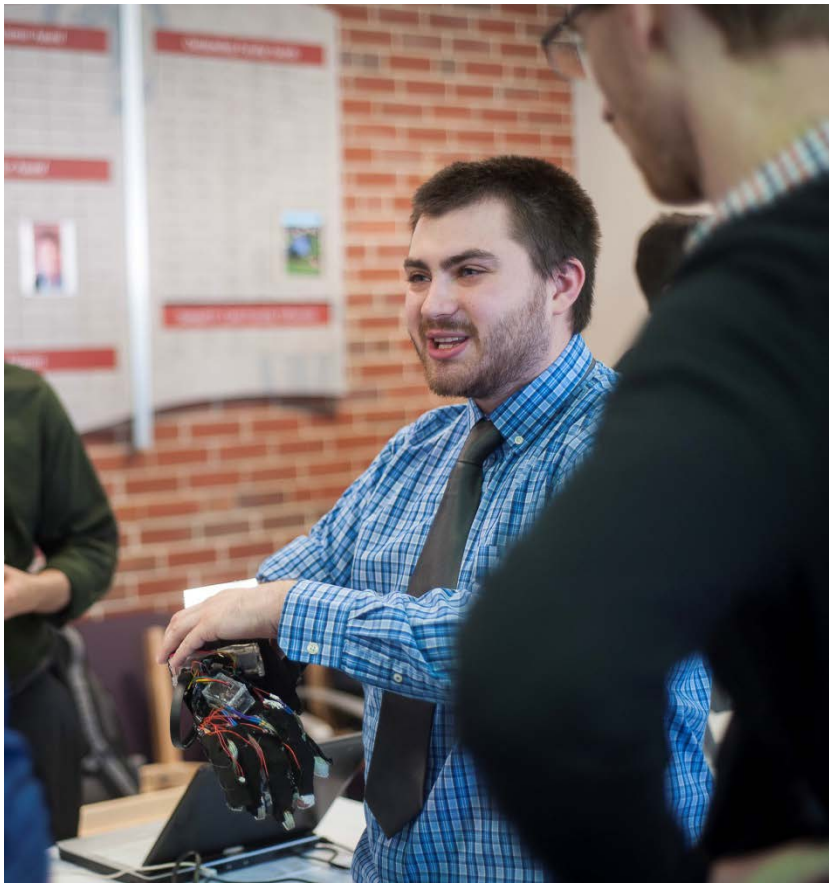
braillebook (SDP16)



SigninGlove (SDP16)

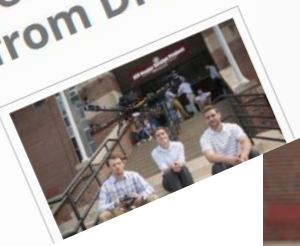






ASPECTS (SDP16)

ECE Students Win First Place in FAA Design Competition By Creating Virtual Geofences to Protect Airports from Drones



The student team of UMass electrical engineering majors Alex Breger, Chris Boselli, Jason Danis, and Sandra McQueen received first place for the winning design in the "Runway Safety/Runway Incursions/Runway


ECE Senior Design Project
Department of Electrical and Computer Engineering
College of Engineering