

# ECE 188

**EE Senior Capstone Design Projects**

# Overview

- EE design sequence taken during senior year.
- Students select a group project offered by an industry or faculty partner.
  - Smaller projects typically 3-5 students, solely EE design.
  - Larger multidisciplinary projects typically 10-15 students, include EE, CE, and/or ME.
- Technical adviser / mentor for each group.
- Establish design specs and project plan, then build and test.
- Present at Engineering Design Showcase at the end of Spring.
- Course Topics:
  - Development of concepts and designs
  - Agile product development
  - Prototyping
  - Project planning
  - New venture creation
  - Intellectual property (patents, TMs)
  - Branding

# Industry Partner Projects



**SONOS**



GeneWEAVE, a Division of Roche Molecular Systems



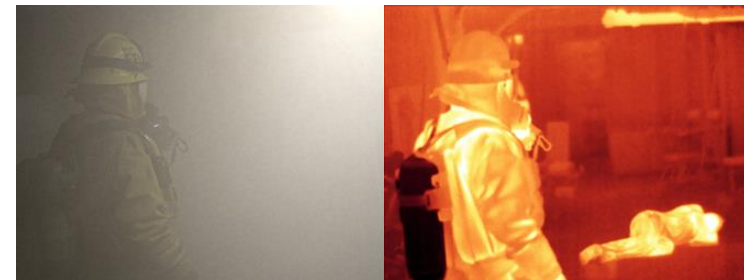
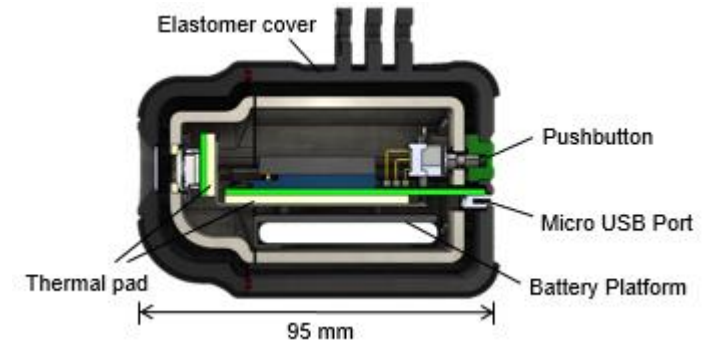
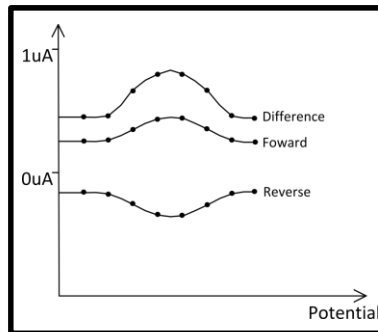
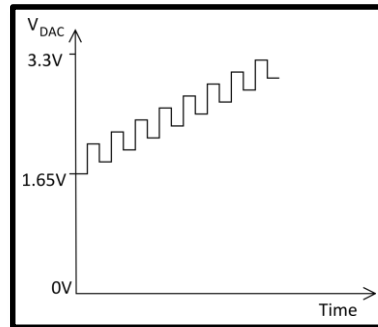
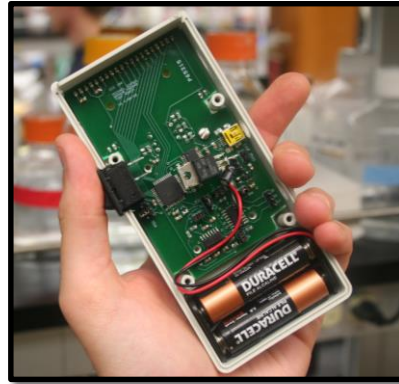
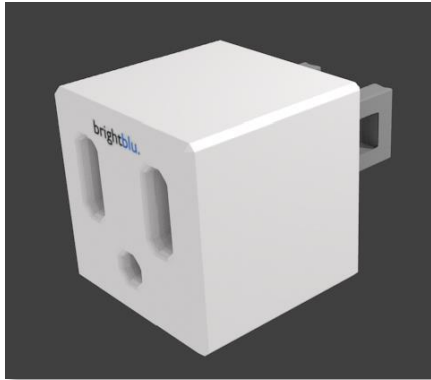
**Wright Electric**



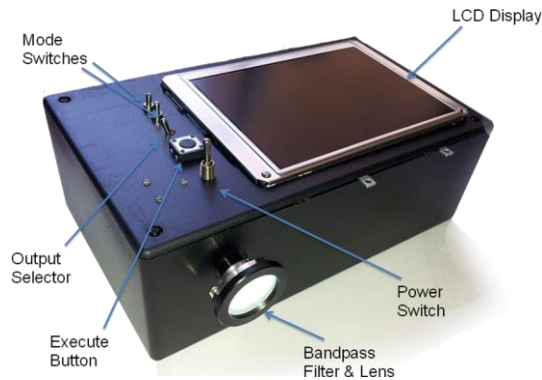
**Raytheon**



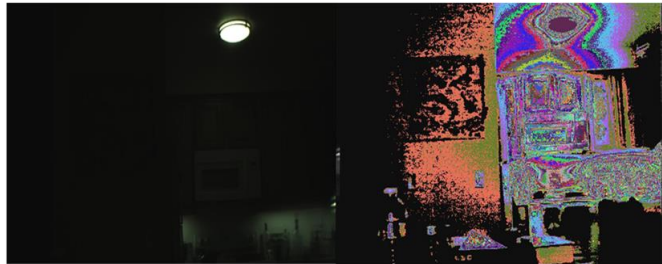
# Project Areas: Circuits, Embedded Design, Mobile Apps



# Project Areas: Signal / Image Processing, Machine Learning



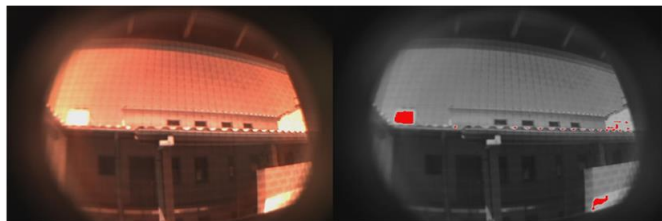
Viewing data in rotated color space – enhanced contrast



Unprocessed image

Processed image

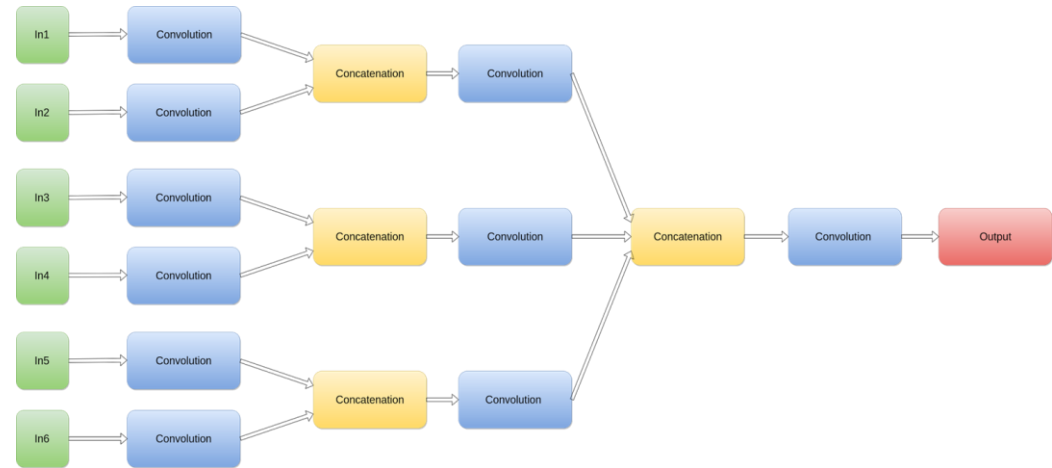
Threshold mode for identifying objects of interest



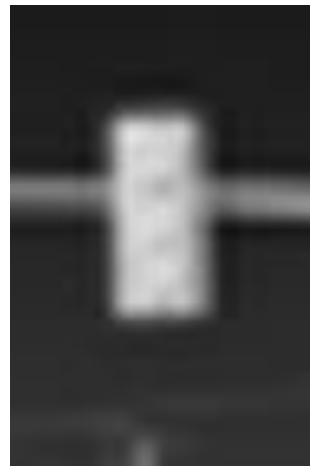
Unprocessed image

Processed image

## Infrared Super Resolution



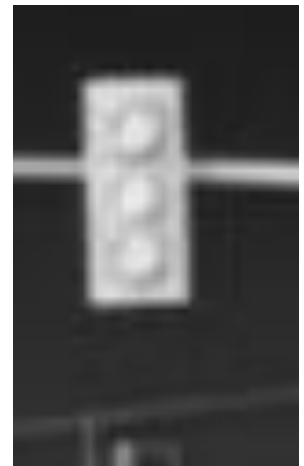
Bicubic



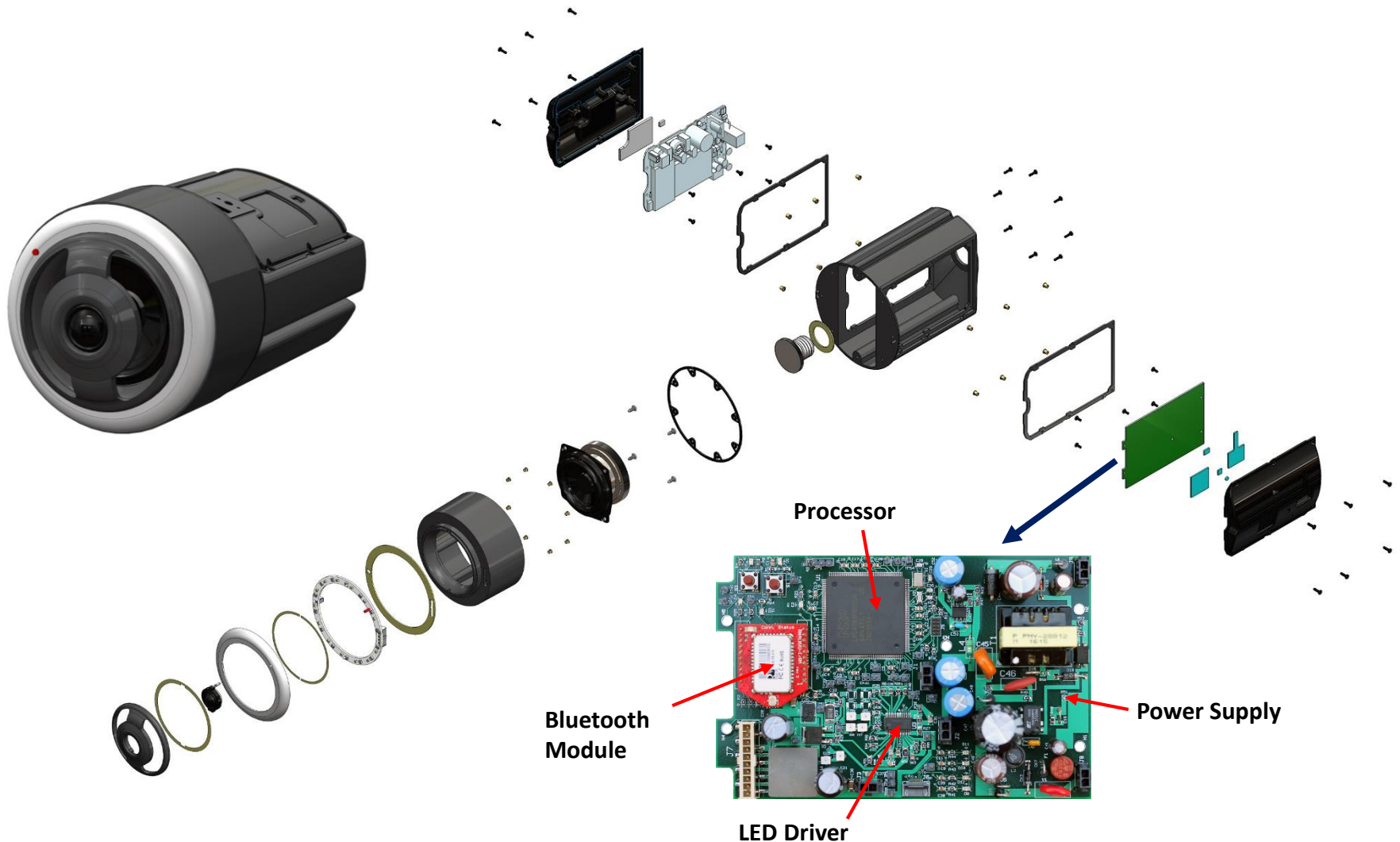
IRSR



Ground Truth



# Project Areas: Larger Multidisciplinary Projects – SONOS Bulb





## Project Areas: Larger Multidisciplinary Projects



# hummingb**IR**d



Stabilized gimbal designed for FLIR Quark 2 IR camera

## Project Areas: Larger Multidisciplinary Projects





# Notable Accomplishments

- 3 companies founded
- 3 patents filed
- 5-6 products commercialized
- 1 product open sourced, currently deployed in 20+ labs in 8 countries
- 1<sup>st</sup> place finish in 2018 SpaceX Hyperloop Levitation Competition
- A number of published papers and conference presentations