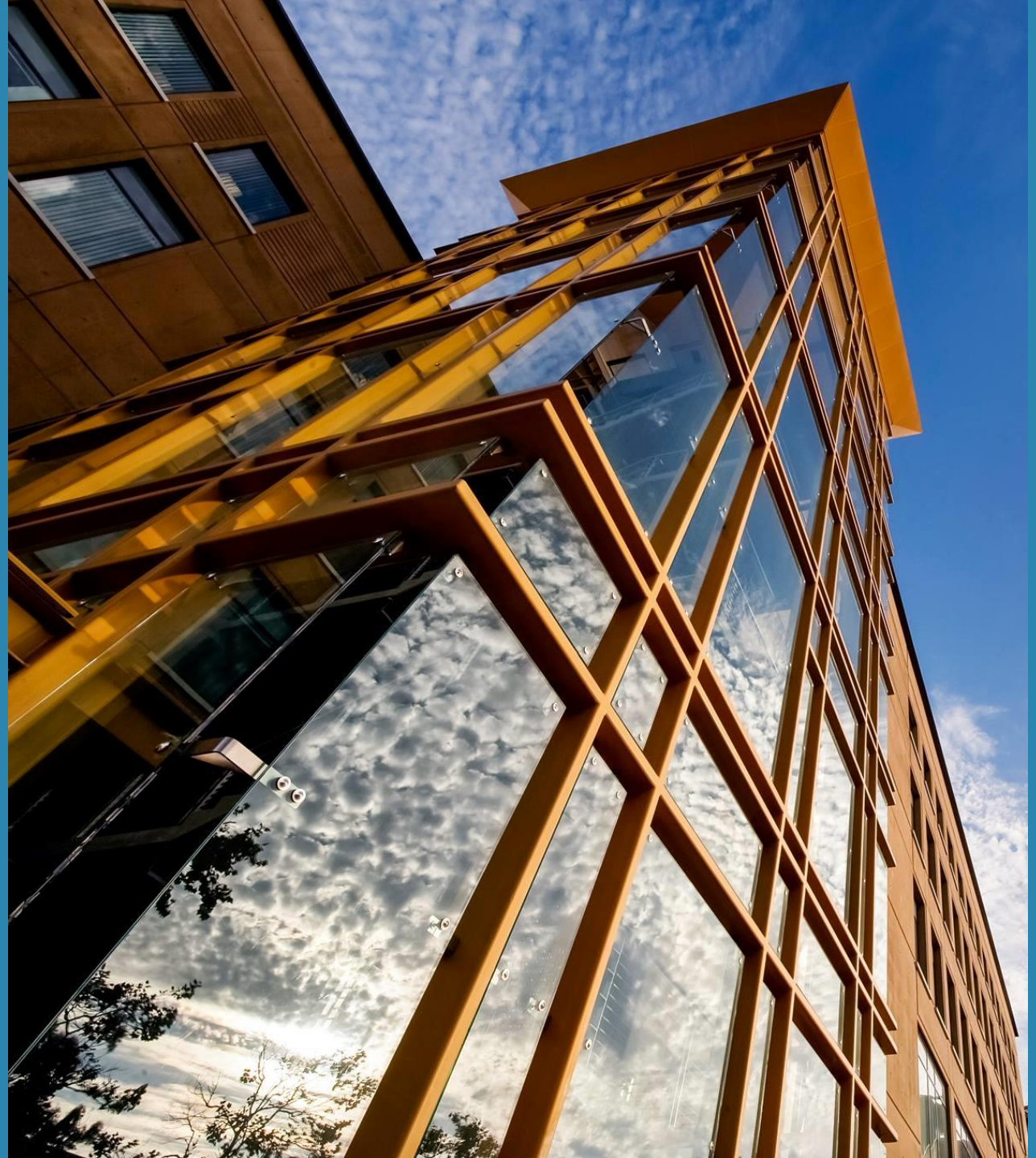
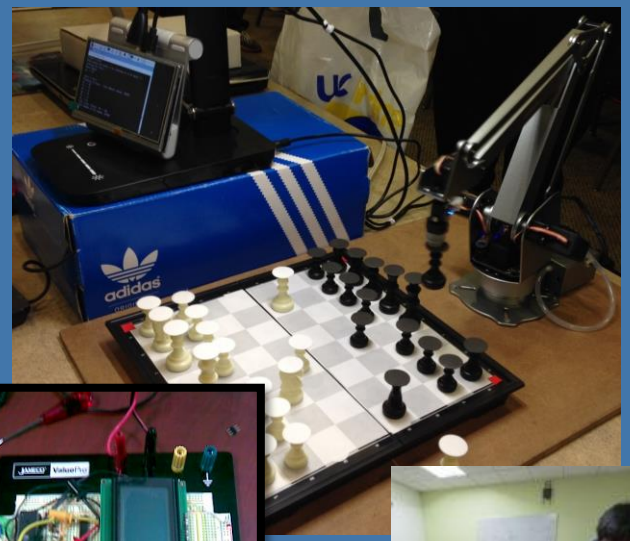


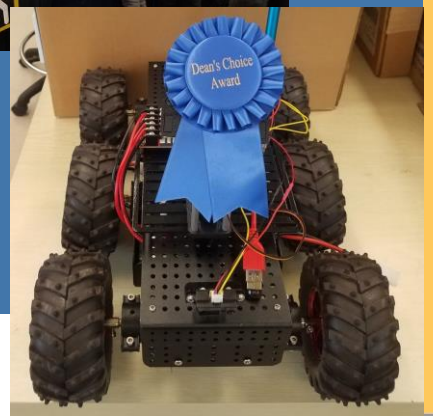
MOVIN’ ON UP… to Senior Design

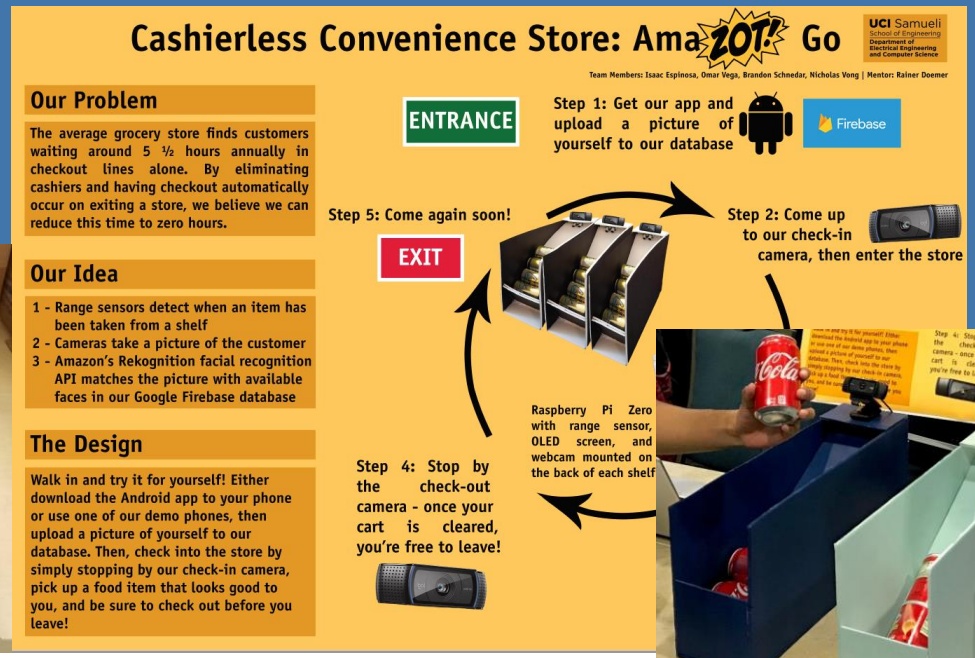
Senior “Pre-Design” & Design Course Series ‘23-’24

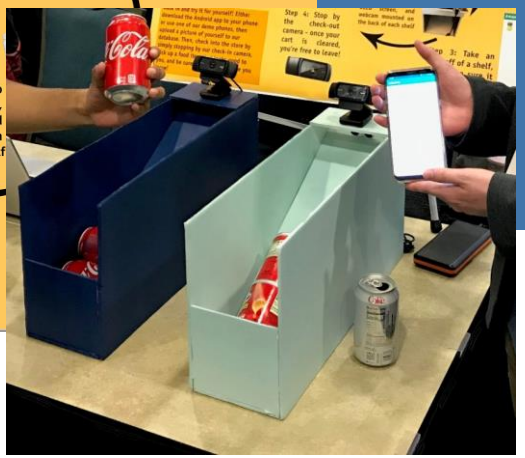
Presented by Professor QV Dang for ‘23 Junior Advising Session

images used in this presentation obtained from UCI-related or stock photography sites









What is Senior Design?

Senior Design Topics/Thrusts

Industry/Faculty Proposed Projects

- Industry Based Projects
- Faculty Research Related Opportunities

Student Proposed Projects

- Sustainability Considerations
- Community/Outreach Potential
- Autonomous Applications
- Internet-of-Things Integration

Makes a Great Portfolio Piece

Your Senior Design/Capstone Advisors

Quoc-Viet Dang

Hung Cao

Maxim Shcherbakov

Your Team's Client/Sponsor/Advisor

Senior Pre-Design – S'23 – EECS 198 – 1-unit – Sign-up, PLEASE

Form a Team of
2-3 Engineers

Brainstorm Ideas
and
Establish Goals

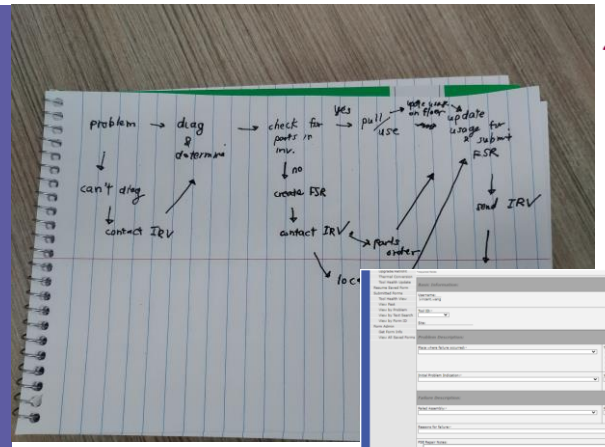
Pitch Ideas to
Sponsor/Advisor/Client

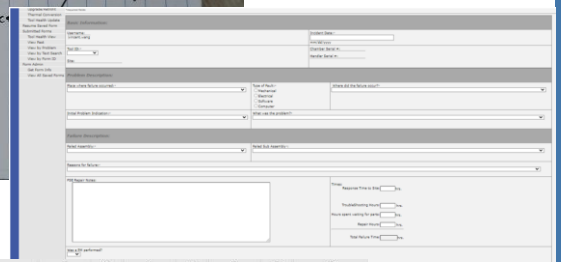
Apply for UROP/SURP

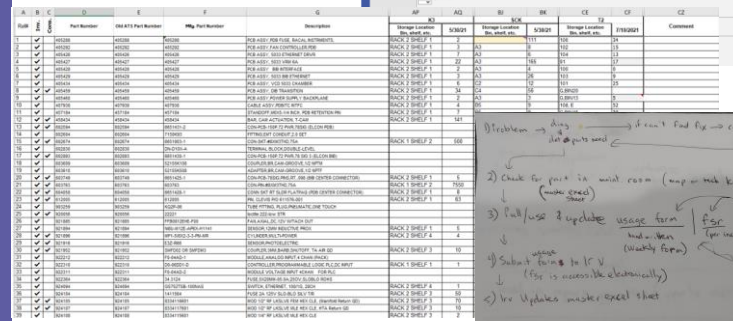
Featured Industry Proposed Project for ‘23-’24

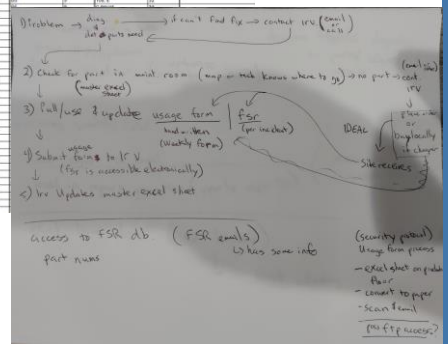
Current Field Service Reporting and Inventory Tracking

- When a part needs to be replaced:
  - Technician checks “master” inventory Excel sheet for levels.
  - They go to inventory location to pull part(s).
  - They create a report on our FSR site, which notes the date/time, user, problem description, part name, quantity used, etc.
  - They update inventory on excel sheet/hand-filled sheet.
  - The updated Excel sheet should be sent to us in the U.S., but this does not always happen on time.
- At every step, there could be discrepancy with true inventory levels because of the manual nature of this process. Also, we have multiple overseas sites, so the problem is amplified more.









ADVANTEST

Proposal

- Web app with GUI and database that replaces our FSR site and manual Inventory Tracking sheet (Excel file)
  - Inventory control and “real-time” reporting
  - Email compatible
  - Oracle compatible

Project Benefits

- Access to Industry Mentor
- Real-world project, real-world problems, real-world use
- Large training data set (hand-written scans, interconnected systems, security considerations)

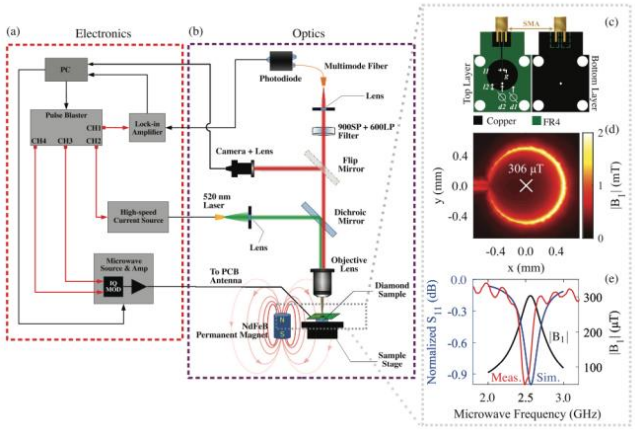
Recent Faculty Proposed Projects

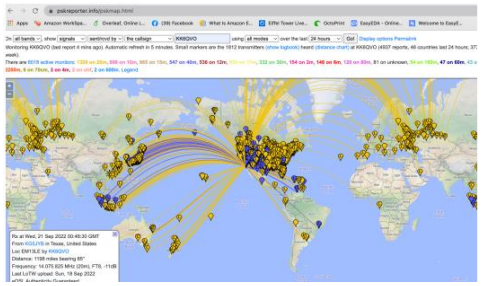
Quantum bit

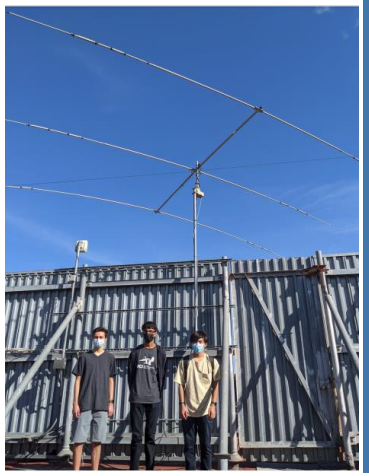
Students will be expected to build and demonstrate a room temperature quantum bit using optics and a magnet, as well as a diamond file, as per this paper:

Sewani, V. K., Vallabhapurapu, H. H., Yang, Y., Firgau, H. R., Adambukulam, C., Johnson, B. C., Pla, J. J., & Laucht, A. (2020). Coherent control of NV − centers in diamond in a quantum teaching lab . American Journal of Physics, 88(12), 1156–1169. https://doi.org/10.1119/10.0001905

email Professor Burke <pburke@uci.edu> if interested







Around the world radio

Students will be expected to get a $20 SDR and a Raspberry Pi, and attach it to the antenna on top of MTSB. The group will write a Python program to monitor radio signals from around the world and record the signal strength.

See e.g. pskreporter for the signal reports from Professor Burke's house. The UCI MTSB antenna should be MUCH better. See https://sites.google.com/uci.edu/k6uci/

Ambitious students can transmit signals if they get licensed by the FCC, which is possible during the period.

email Professor Burke <pburke@uci.edu> if interested

Recent Student Proposed Projects

Autonomous Vehicle for Localization and Mapping of Indoor and Remote Spaces

This project aims to take similar mobile robotics indoors and apply it to small, enclosed, or remote locations. This project is based on a ROS software framework and does image processing from camera data using OpenCV and Nvidia Jetson CUDA cores, allowing it to detect lanes and road edges.

Privacy of Voice Activated Devices

We added a feature to voice activated devices that provides an extra layer of privacy protection. This feature consists of a signal jammer that can be controlled by an external app. This would provide convenience for the user to activate jammer from the click of their phone to ensure complete privacy while still having full access to their voice activated device.

Looking to the Future

Visit ‘23 Winter Design Review

3/17/23 from 1-4pm @ UCI Cove at Beall Applied Innovation
5270 California Ave. #100, Irvine, CA 92617
https://uci.co1.qualtrics.com/jfe/form/SV_7VvF8A9K0kdHZ9s

Thank you!
Questions/concerns?