Project Competition

Spring 2021

Registration: March 24th 11:59 PM | Completion: April 11th 11:59 PM

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Registration Link: https://forms.gle/okHJ6fGoVHCgGniYA

CSU Chico IEEE Student Branch
Website - https://site.ieee.org/sb-csuchico/
Discord - https://discord.gg/RqPdMb7hR9
Email - csuchicoieee@gmail.com
Youtube - CSUChico IEEE - YouTube

Overview

For all Chico State Students of any major, the CSUC IEEE student branch is hosting a project competition to encourage students to perform research and document it. This project can be done individually or within a group, top projects will be rewarded with a $50-$75 Amazon Gift Card, and this competition can be free to conduct as only a proposal for the project is asked for. Winners for the competition will be distinguished between Upper and Lower division students, and for those who have not taken upper division EECE classes, these students will be classified within the Lower Division category. To win the competition, you do not have to be a student within the EECE Department, but the students who have registered must attend at least one IEEE meeting. If a project does well, it might be financed to be built for the O'Connell building on campus. **Below is additional guidance and rules for the projects, but all given information on projects is interpretable as other projects with similar aspects are welcome.**

Goals

Walking into the O'Connell building used to be a delight for most engineering students, but quarantine has restricted this. As soon as students are able to return to campus, the Chico State IEEE would like to be able to welcome everyone as they enter the building. The method used to welcome students back will be the base idea for this project competition.

In the new semester, everyone who walks into the O'Connell building should be greeted with an autonomous system; the system should be able to run all day long without anyone controlling it and shut off if no one is present. Computer related majors could focus on creating software to acknowledge when people are present and turn on the system. Majors with electrical engineering classes could focus on a large display, creating a driver circuit with a microcontroller, and powering the system. Students who haven't taken Upper Division Electrical or Computer classes have more freedom in their project as it must only be powered and take in an electrical signal to begin their project; these students might want to create an Arduino based project to wave a mechanical arm, display a message on an LCD, or control a variety of LEDs to decorate the area with.

With multiple projects used to create a singular system, people will be able to walk into the building, recognize that they have been noticed, and take in a warm welcome. This warm welcoming is a general idea, but each category of students will be provided with example projects to complete.

Specifications

Lower Division Students:

This category of students will include those who have not taken EECE or CSCI 300 level classes and above. Students within majors outside of the ECC College are welcome and can register for this competition. Anyone who has registered for this competition is expected to attend at least one CSUC IEEE meeting before the due date. Meetings are held biweekly and special circumstances can be made for students who are not able to attend one of the meetings by contacting us through the IEEE email listed above.

Lower Division Students have yet to take courses that would support higher-level projects, but this does not restrict students who fall in this category from completing an Upper Division Project. All students can register for the Upper Division Projects, but **not all students** can register for the Lower Division Projects. Transfer students who are within the EECE department and have yet to take 300 level EECE or CSCI courses will be permitted to register for the Lower Division category.

Example Projects:

·   Arduino, Raspberry Pi, or any Microcontrollers

> o   Waving Arm created from plastic, cardboard, metal, or any other material could be powered with a motor and driven by the Microcontroller.
>
> o   LCD Screen that gives a welcoming message to people.
>
> o   LED Strips that are driven by the Microcontroller and produce a small light show.
>
> o   LED Cube or other structures to produce a small light show.

·   Digital or Analog Clock made up of any components.

·   Holiday Themed Project – might only be used some parts of the year.

> o   Create a light up heart with LEDs and a small battery.
>
> o   Light up mask for Halloween.
>
> o   Graduation Lights to wear on cap and or gown.

One aspect that will be graded for these projects is **creativity**. These example projects are welcome to be used, but a project outside of the base idea of the competition will be welcomed. If the project turned in is vastly different from the base idea of the competition then it will be judged accordingly and could be considered if it could be helpful to the CSUC IEEE.

This will be stated multiple times: Students are **not** required to make any purchases and are advised to not do so. This competition should be free, but participants are welcome to actually complete the project at home. A proposal of the project is all that is asked for and the following should be included: source code, designs, list of required parts, and detailed description on the procedure to complete the project. More details on the turn in of the project will be provided below.

Upper Division:

The Upper Division Projects should be related to Electrical or Computer Engineering, but all students are welcome to compete in the category of the competition. It would be advised to have taken classes of EECE or CSCI 300 level and above. The complexity of these projects will be more favored than that of the Lower Division projects. All project examples could be simplified to reduce complexity or combined to create a larger project.

Example Projects:

·   Using OpenCV, create a real time algorithm that detects a face, tracks it on a camera, and turns on or off a system depending on whether a face is recognized in the image.

·   Using any microcontroller or Raspberry Pi with a camera, take in images and process them before outputting the images to a display.

·   Find or create a LED display, driver circuit, and power supply.

·   Create an audio system that will take in a signal, process the signal, and output it to a speaker.

·   Design the PCB for a microcontroller and program it to be a driver circuit for a display.

·   Utilize sensors and signal processing techniques to realize a robotic system and perform a task such as driving a small car or managing robots.

·   Telerobotic hands - LINK

General Rules:

·   Only students are able to register for the project competition.

·   To be eligible to win the competition, the student must attend at least one CSUC IEEE meeting.

·   Students that have taken upper division electrical or computer classes are not eligible to compete in the Lower Division category.

·   There are 4 prizes of $50, 2 prizes for each category, and only one prize for one project.

·   The 2 prices for the Upper Division Category will likely be separated by project type, dealing with either Electrical or Computer Engineering.

·   Working in a group is encouraged as the reward will be increased from $50 to $75 to be shared among members.

Turn In

The turn in for this competition will be through google forms and will open a week before the deadline of the project. It should be turned in as a pdf and there will be no exact format, but a traditional lab report or IEEE report would be adequate. An example proposal will be placed on our website and attached to the registration form.

Proposal Contents:

·   Hardware Components (Microprocessor, resistors, capacitors, 6ft by 6ft of metal sheet, ect) with quantities.

> o   Explain why these components are necessary and how they are used in a design.

> o   Cover specifications from datasheets that affect the project.

·   Software

> o   Include the interface and language, and explain the source code created or used.

·   Procedure to explain the process of completing the project.

·   Simulation should be included.

·   Theory and other calculations should be explained.

·   Any form of design that is used such as circuit design or dimensions for a mechanical system.

Not all contents of the proposal will be the same for each project, but if these contents are applicable then they should be completed. Details are essential as the project could be chosen to be implemented on campus.

After the projects are due, they will then be organized, with names removed, and given to a select few teachers to judge in the following categories:

·   Creativity/Complexity

·   Functionality

·   Documentation

·   Cost Efficiency

Helpful Links(we will add more over time):

[Telerobotic hands and fingers become your avatar at Amazon re:MARS | VentureBeat](#)

https://youtu.be/LnzuMJLZRdU

https://www.youtube.com/watch?v=l7rce6IQDWs

https://www.youtube.com/watch?v=oXlwWbU8l2o&list=WL&index=60&t=7384s