



IEEE

Foothill Section Monthly Newsletter

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This newsletter is brought
to you by:



IEEE Foothill ExCom/OpCom October Monthly Meeting

Prepared by: Max Cherubin

The IEEE Foothill Section ExCom/OpCom meeting was held last October 11, 2022. The chair had a lot of reminders and concerns raised in the section. They were regarding the Joint Engineering Society Event at CPP by NSPE-CA, Foothill Section Election 2023, In-person Meeting, helping the China lake-Bakersfield Section, Rising Stars Conference 2023, and SusTech 2023.

Months ago, Landon Burns, a representative from NSPE (National Society of Professional Engineers) contacted our section to connect with their organization which includes professional engineers from all disciplines. They reached out to our section along with ASME and SWE. They invited us to sponsor members that would be interested or our professional engineers for a information luncheon.

IEEE Election is a yearly event to select officers to facilitate the section, and since the year is almost over, the chair is now reminding the section to prepare for it.

The chair is proposing to have an in-person meeting once every quarter. Max Cherubin is considering DeVry University as their location for an in-person meeting; the rest will be online.

SusTech 2023, according to David Gonzalez, one of the coordinators, for this year will be hybrid via Zoom, and they will be celebrating its 10th anniversary. They are concentrating more on the business aspects of things. The in-person event will be in Portland, Oregon.

Rising Stars 2023 is an annual IEEE event that takes place every January. We did not receive any updates yet from Alberto Tam Yong is one of the coordinators

Osman Ceylan, our vice-chair, volunteered as our coordinator for SusTech and Rising Stars.

Section and Committee

We have had nine new members for Membership and Development over the last month. Three for member grade, and the rest are students and student graduates. We had one senior elevation the previous month, which was Deborah Hagar.

To advertise the section and encourage volunteers, we need to keep posting our events on our Facebook and LinkedIn pages and our social media accounts. In our social media accounts, we have a new member on LinkedIn and two new members on Facebook. Now we had a total of 314 visitors from last month.

Student Chapter

Sonny Ding from UCR said their chair stepped down, so their vice-chair stepped up. They had their second board meeting and conducted another officer election. Now they have four new members and are discussing their schedule for their general meetings. They plan to show a compilation video of UCR events at their first general meeting.

Mia Brandenburg, treasurer of CPP. In their meeting, they discussed plans for CES. They are trying to obtain funds from the school for the conference; in the booking process, their interest forms will probably be finalized by the end of the second week of October. They also had a guest speaker, and his name is Eric Schleifer.

Seth Gil, CBU chair, reported that they had a game night on the first week to get everyone accustomed to meeting the first- and second-year students and junior and senior electrical engineering students. They also had a workshop where they used that software to teach people that attended introductory PCB design. They are also planning a workshop, one of which is the soldering workshop with the board they designed. They are also planning to make a puzzle box.

Carson Weeks, the chair of CSUSB, said they had workshop plans, and they are trying to get back on track again after a year of being inactive. Now they are working on this workshop where everyone works on a robot arm together. They just got a new 3D printer. They are printing out some pieces and doing a test run. That is going to be the workshop on Arduino and 3D printing.

Prof. Nazila Safavi from DeVry University said that they had a total of 26 members for their branch. They will have some contestants going up to join the October Extreme 16.0 Coding Competition and will conduct a meeting this week. They also have a LabVIEW Workshop on the 27th.

Technical Committee

Scott Wedge reviewed the recorded list of the events they had for this year, and he mentioned the CLASTECH, which will be on Nov. 4th and will be held in El Segundo. AP/MTT had Jon Martens as their speaker from last year's Distinguished Microwave Lecture. They are possibly working with Jasmine Grotzinger from Graz University in Austria to do a separate talk for them. But she will present it in person after this at the Qualcomm Auditorium, which is hard to beat. They have been communicating with Ram Archar, the vice-chair of the Electron Device Society chapter. He is doing a distinguished lecture on signal integrity and high-speed interconnects. He offered to do an in-person class in our section, which is still in discussion since he wanted to do it on Thanksgiving day. Scott and Jonas have been communicating with Ram about the Distinguished Lecture 2023. They are also proposing to the student chapters for the 75th Transistor Anniversary; if they are interested in having a birthday party for the transistor at their student chapter or maybe at their next general meeting, we will provide or pay for a birthday cake or some food. So it's like celebrating both the celebrant and the 75th anniversary of the Transistors.

Nanotech had a meeting regarding the SETC. This year they will be having college students and high school students. The high school students they work with are Diamond Bar High School and Walnut High School; both are in Walnut Valley Unified School District. Christopher Lai went to Diamond Bar High School and talked about the SETC. He will be mentoring them, preparing the abstract, the presentation, and all the necessary details related to SETC. About 2-3 teams are surrounding the topics of drone and robotics projects. The website has been updated regarding the items, including the abstract's new description and submission documents.

One of the requirements for the student to participate in SETC is to attend the Hyperloop Workshops. Hyperloop this semester has begun 12-part workshop series like Python Circuit Analysis, Starting Construction Design, Artificial Intelligence CAD, 3D Printing Pipes on Application, Soldering MatLab, Career Developments, and Arduino. So far, they have done 6 out of 12 workshops this semester which means they are halfway done with season 3. They are past six weeks, and they just had a CAD workshop that covered 3D modeling. Christopher told the high school students to submit the requirements during the second semester. The Circuit Construction Workshop had 54 participants, making it the most significant workshop of all thirty CPP students and 17 high school students. Many non-engineering majors got to learn about circuit analysis and circuit construction skills. They also introduced this workshop to beginners. They had 35 students who attended with no experience in circuit analysis or specific construction and went to that workshop to learn.

Dr. Tamer Omar wants a meet and greet for the ComSoc chapter and to collaborate with AP/MTT/Ed-Cas because he wants a ComSoc chapter for the student branch in CPP. He encouraged the students to be involved with this proposed event. He also attended the ComSoc Chapter Leaders meeting. It is a meeting where chapter leaders can share what is working or not in the chapter and how they improve the chapter. They even send out surveys which are long survey that typically lasts for like 45 mins. He also talked about CPP Cybersecurity Fair, which will be on Oct. 20th.

Kim Mosley and the WiE Chapter will have a joint event with the Consultants Network with their guest speaker Kathleen Kramer. Kathleen was a candidate for IEEE President-Elect, 2023, and brings extensive experience and background in Aerospace Systems but is also a model for dedication and service as a volunteer for the IEEE organization. She will enlighten and inform us on what is at stake in securing aerospace systems using AI and share her insights as a consulting engineer.

CPP Hyperloop 2022 Workshop Series

By: Christopher Lai

Introduction

CPP Hyperloop is hosting a 12-part workshop series for the Fall 2022 semester, which will be the third season of workshops for the organization. The workshop topics are diverse, STEAM-related, and geared towards introductory project development for students. The 12 workshop topics are Python, Circuit Analysis, Circuit Construction, PCB Design, Artificial Intelligence, 3D Modeling, 3D Printing, Python Applications, Soldering, MATLAB, Career Development, and Arduino. Out of all these events, four are lab-type workshops, which provide students with hands-on learning experiences with project kits, guided curriculum, and lab equipment. These special workshops are Circuit Construction, 3D Printing, Soldering, and Arduino. Other workshops are considered as lecture-type workshops, in which students can come to learn to work with useful computer software, in addition to how to use STEM theories and concepts for applications in robotics and project development.

All workshops are free for students to attend, including the lab-type workshops. The lecture workshops occur on Fridays from 6 pm-8 pm and lab workshops start one hour earlier from 5 pm - 8 pm. This semester, CPP Hyperloop has begun collaborating with nearby high schools, such as Diamond Bar High School (DBHS) and Walnut High School (WHS), in order to provide educational opportunities for the younger generation. Lab workshops are held in two locations: at CPP and at DBHS. Currently, CPP Hyperloop has successfully held four workshops since the beginning of the semester, with PCB Design being the most recent. The full schedule and further information for the Fall 2022 workshop series can be found on the CPP Hyperloop website: <https://www.cpphyperloop.tech/workshops/s3-fall-2022>.

Lecture Workshops

Three lecture workshops have been held, providing students with the opportunity to learn software and hardware skills for the purpose of developing their own projects.

Python Workshop:

Add The Python Workshop, hosted by Christopher Lai, was the first workshop event hosted for the Fall 2022 series. During this workshop, students brought their computers to learn about setting up a compiler and environment to code in, using Github and GitHub Classroom for repository management, and the fundamental concepts a little bit of body text of programming. During the two-hour workshop, the hosts and assistants were able to get all of the students successfully set up with Python 3.9.7 on Visual Studio Code. Students were then able to program in Python in both the Command Prompt and the compiler. Special challenges were created while instructing the material in order to encourage audience participation and to generate a fun learning environment. Students learned how to use print statements and input statements, how to work with data types and arithmetic, how to compare statements using comparison operators, and how to write if statements. Supplemental material covering loops, functions, and classes is provided to the students after the

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Circuit Analysis Workshop:

The Circuit Analysis Workshop, hosted by Christopher Lai, aims to provide students with an accelerated overview of how different circuit components are useful when creating robotics or mechatronic systems. The workshop started with a basic overview of circuit theory, instructing students on what current, voltage, resistance, and power are. Applications to basic home appliances and how each aspect of electronics relates to the real world assisted with clarifying the concepts. Then, the important laws of circuits were introduced, such as Ohm's Law, Kirchhoff's Voltage Law, and Kirchhoff's Current Law. The voltage divider example was provided and used as a bridge between the laws and further circuit applications. One central theme used throughout the workshop series is voltage regulation, so it was explained how the voltage divider could be used as a simple (but ineffective) voltage regulator. The second half of the workshop consisted of many applications to circuit design that utilize higher-level components. The important topics discussed revolved around voltage regulation, driver circuits for motors or solenoids, reverse polarity protection, and logic gates. Supplemental material which consisted of circuit design challenges and Multisim tutorials is provided to the students after the workshops to encourage further learning.

PCB Design Workshop:

The PCB Design Workshop, hosted by Victoria Nguyen and Christopher Lai, is an event designed to provide students with an introduction to PCB Design concepts, theory, and applications. During this workshop, students have the opportunity to follow along and design a Voltage Regulator Utility PCB, and also to design their own custom PCB for use in a project. Victoria Nguyen is a senior at Cal Poly Pomona with industry experience in PCB design and mainly uses Altium Designer as the Electronic Design Automation (EDA) software of choice. Altium Designer, which usually costs about \$4000 a year to use, has a free student edition program for college students to learn from. Since the workshop is held in collaboration with high school students who cannot download Altium, Christopher Lai held a workshop in parallel going over the same circuit in KiCAD, which is an open-source EDA for PCB Design and free for high school students to learn from. Important concepts discussed during the workshop include how circuit components are represented as footprints, symbols, and 3D models in a circuit, how to construct a circuit schematic, how to link symbols to footprints using a library loader, how to place components on PCBs, how to route components using IPC standards, how to create polygon pours, and how to prepare the schematic file for fabrication at a PCB fab company. Students are allowed to submit a design of their own after the workshop for free fabrication provided by the CPP Hyperloop team.

Lab Workshop:

One lab workshop has been held during the month of September. Lab workshops provide students with hands-on learning and the ability to work with equipment and tools commonly used for project development.

Circuit Construction Workshop:

The Circuit Construction Workshop is a follow-up event to the Circuit Analysis workshop. During this lab-type workshop, students are provided a circuit kit consisting of common electronic components used for circuit prototyping. This kit includes breadboards, resistors, LEDs, buttons, diodes, capacitors, transistors, a power source, and more. This also includes custom 3D printed appliances, like the Pocket Breadboard and the Component Gauge used to simplify circuit construction. For this workshop, students attend a 1-hour safety lecture beforehand covering how to use lab equipment such as wire strippers and the multimeter. Then, six circuit construction challenges are introduced to the students, which span from simple circuits to difficult circuits. These challenges span simple circuits, such as working with LEDs and switches, medium difficulty circuits that work with transistors and digital logic, to more complicated circuits that work with 555 timers to generate a clock signal and a PWM signal. Students are allowed to take their circuit kit home with them after the workshop and keep constructing circuits on their own time.

CPP Hyperloop Workshop Series



Figure 1: Python Workshop, hosted by Christopher Lai



Figure 2: PCB Design Workshop (KiCAD), hosted by Christopher Lai



Figure 3: PCB Design Workshop (Altium) hosted by Victoria Nguyen

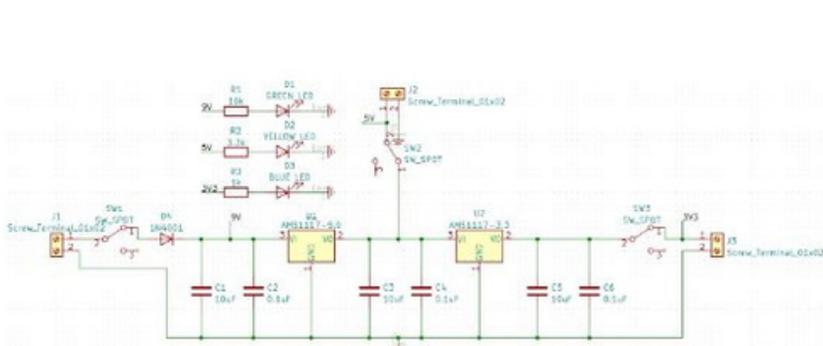


Figure 4: Voltage Regulator Utility Circuit Schematic

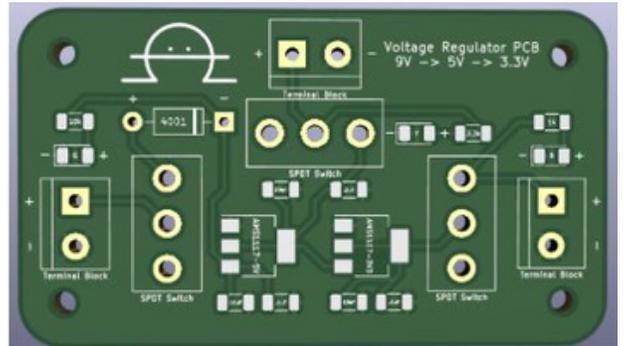


Figure 5: Voltage Regulator Utility PCB



Figure 6: Circuit Construction Workshop, Safety Lecture & Equipment Tutorial

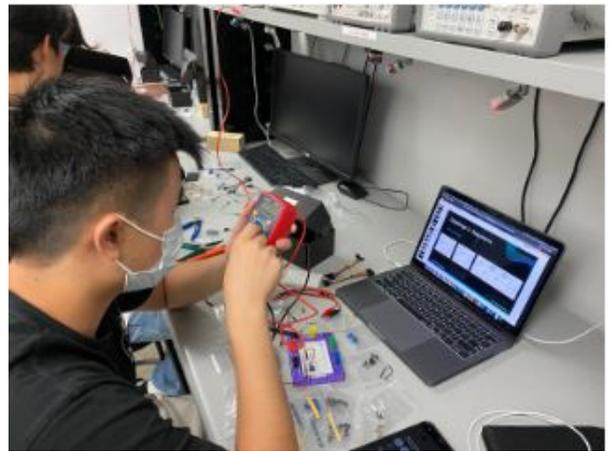


Figure 7: Circuit Construction Workshop, Lab Portion

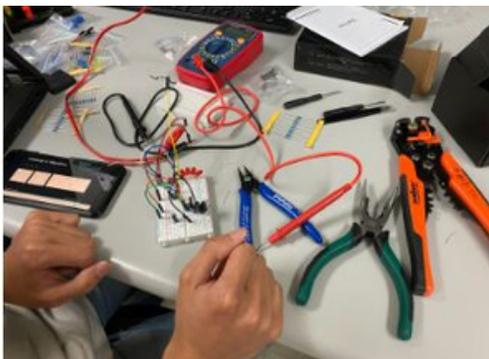


Figure 8: Circuit Construction Workshop, Student Circuit Demo



Figure 9: Circuit Construction Workshop, Student Demo



Figure 10: Circuit Construction Workshop, Student Demo

Upcoming Events:

- **IEEE Foothill November ExCom/Opcom Meeting**
Nov. 08, 2022
- **IEEE Foothill Consultants Network Meeting**
Nov. 02, 2022
- **ClasTech 2022**
Nov. 04, 2022
- **IEEE Foothill ComSoc Chapter: Meet & Greet**
Nov. 19, 2022

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Note: If you want to be a volunteer, just email sec.foothill@ieee.org