



# IEEE Foothill

## April Monthly Newsletter

(<http://foothill.ieee-bv.org/>)

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This Newsletter  
is brought to by:



### IEEE Foothill ExCom/OpCom Monthly Meeting

Prepared by: Max Cherubin

The IEEE Foothill ExCom/OpCom Monthly Meeting occurred last April 12th, 2022, at 7:06 pm, with chairman announcements. First, the section sympathized with Rod Foist's passing. Rod was a professor of Electrical and Computer Engineering at the California Baptist University, an IEEE member, and a past CBU Student Section Advisor. Second, it is regarding in-person and virtual meetings starting May 2022, unfortunately doing hybrid meetings requires extra requirements and equipment, so the earliest we will be ready to begin the in-person meetings is June 2022.

#### **Section and Committees**

For the update on our Membership Development, we are still below historical averages at 809, but we increased by 38 over last month's report. We had a newly elevated senior member Robert Lloyd, and Kim is still sending outreach letters to gather more members and volunteers.

For our Social Media and Website, for the last month, we had 300 visitors. We are encouraging all the members who have events related to IEEE to post them on our group page or the least on their personal Facebook/ LinkedIn accounts because, in that way, we can advertise our section and promote IEEE.

#### **Student Chapter**

Derek Mata reported the UAV Senior Project, winning best Undergrad Paper at the recent WTS conference. They are an Interdisciplinary Team of Mechanical Aerospace Electrical Computer Engineers from CPP. They are 42 students in total and split up into ten different sub-teams. Their goal is to use a hybrid UAV tool to monitor power lines at its mission profile.

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To do it, they created Autonomous Flight Software and Camera Object Detection Software so that they can track the power lines as they are flying along.

Ivan Magana from CSUSB reported that on April 22nd, 2022, they will have their annual Hackathon to give students an idea about Cloud Computing and working with AWS. They are planning to have a Drone Construction Workshop next summer.

Prof. Nazila Safavi DeVry reported that they had a workshop with Dr. Penn Wu, who demonstrated how to create a simple blockchain in his presentation that occurred last April 8th, 2022. Prof. Safavi submitted a report on this on the next page.

Michael O'Dea reported for UCR that they had a gathering and talked about plans like workshops and presentations. They will have a Micro Mouse Competition soon.

### **Technical Societies and Committees**

For MTT/Ed Cas, the last thing they had was about their election. They closed the data and had an uncontested election that ran smoothly. All of the candidates got 100% of the turnout. While on APM, about 22% and the EDS was about 14% turnout. With their new set of officers, they are making arrangements for Distinguished Lectures later this year. They also reserved three Distinguished Lectures worldwide and looking forward to getting updates and times in the hope of meeting in person.

Nanotechnology Dr. Yu promoted their event on May 3rd, <https://r6.ieee.org/socal-nano/>, held virtually through the Zoom app. They will have Dr. Eric Potma from the UC Irvine U.S., who will talk about how to turn a simple camera into an infrared imager. She also reported about the CPP Hyperloop Workshop, which the NTC sponsored.

Dr. Tamer Omar from ComSoc discussed their chapter election and that they are still planning about it, and he is looking for volunteers who can be part of their chapter. He talked about how successful the WTS 2022 and during the last day of the event, they had a total of 50 people who were present, and the WTS 2023 will be held in Boston. They also had an IEEE ComSoc New York Chapter for a technical event, and they were the co-hosts. The event was Integration of Terrestrial Network and Extreme Environment Challenges and Capabilities. The speaker was Dr. Madi Ramada.

Dr. Nanpeng Yu reported that they had a couple of activities for the past month. The North America Single Phase Hour Initiative Workshop was organized by the joint Pacific Northwest National Laboratory of the Power of Energy. As far as Electric Research Institute, he was invited to talk on one of the major multi-million dollar projects at the Department of Energy-funded SL, trying to discover signatures, anomalies, precursors in large scale, single phase, or data using computer networks. They are talking about petabytes of data. Dr. Yu just spoke about the various technical accomplishments with their industry partners. Two companies also in Southern California, he powered the data quality improvement on how to develop these missing out of a replacement algorithm to detect the power system using graphics processing optimization with structures processing using Norm's Bi-Directional Generative. That is just one of the activities Dr. Yu reported.

Ray Moreno, chair of the Computer Society, and Bill Grist are trying to have a presentation probably in early June to ensure that it will come off well. Ray is still working on their election chapter and still looking for volunteers, and he reminded everybody about SusTech 2022.

YP chair Sherry Buitter moved out of the section, but we had Landon Burns from NSPE (National Society of Professional Engineers). He's part of a task force member who does tasks or events, and one of the things they want to start doing is in-person events. They want to have a social event (lunch or dinner) with the IEEE Foothill Section in Fall 2022. Landon explained what NSPE means; it's about state registrations for engineers. Someone building a hospital or a bridge has to have their designers signed and sealed by a professional engineer. It is where they regulate by state licensing boards, and NSPE advocates for those professional engineers.

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For Consultants Network, they were only 3 or 4 people who attended their meeting. They are planning to change their meeting date to its original one, which was every first Wednesday of the month, and for it to happen. The chair decided to have a survey for the members on what day they prefer to have a meeting. The result will be given on their next meeting on April 27th, 2022.

## Managing Soldering Workshop Logistic

Prepared by: [Christopher Lai](#)

The motive behind creating the project kits for the soldering workshop came from the realization that there were not too many hands-on activities currently available to students on campus. CPP (Cal Poly Pomona), primarily a project-based club, aims to expand student opportunities by offering a weekly workshop series. This series, which started in Fall 2021, offers to teach students crucial hard skills related to all engineering majors, such as python coding, 3D printing, PCB Design, and other manufacturing skills. These workshops have been advertised to all engineering students, including those in CPP IEEE and CPP Robotics. We can also get students from non-engineering majors, such as Computer Science and Visual Communication Design, by word of mouth. These workshops emphasize the purpose of our club's existence, and the outreach to students has successfully made hands-on learning experiences available to all.



We hope the project experience, which had a net attendance of 30 students, encourages students to explore the world of engineering and problem-solving in their way. We hope that the students will understand the skills required to do their projects and solve their problems based on the mentoring that leads from both clubs provide in these workshops.

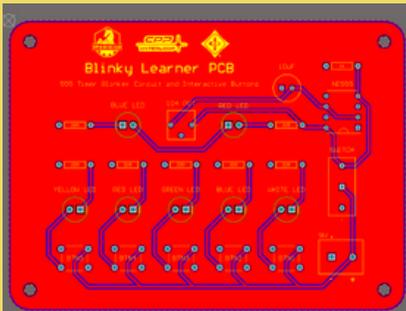


We have produced 50 Blinky Learner PCB Soldering Kits for Cal Poly Pomona students to work with during the Soldering Workshop.

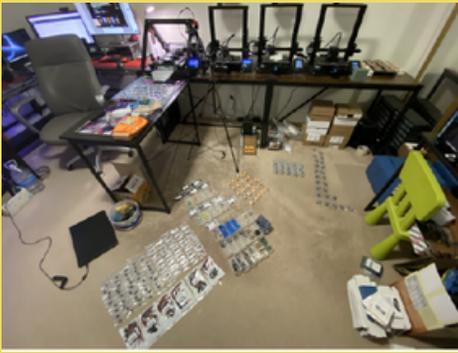
In its essence, Blinky Learner is a small project from start to finish. CPP Hyperloop and IEEE leads have developed this small project as a gateway for students to start developing their own more prominent and more complex systems. We walked them through the development process in the previous workshops leading up to the soldering workshop.

During the PCB Design II workshop, we discussed using the 555 timers as a stable multivibrator to blink a pair of LEDs on and off, synchronous with the 50% PWM timer generated from the voltage toggle in the 555 timer's discharge pin. We meet over the circuit, the simulation on Multisim, and how to construct the PCB schematic and board design in Altium.

We discussed using a custom footprint for circuit elements to align with the board throughout the workshop. We taught students how to construct the entire PCB.



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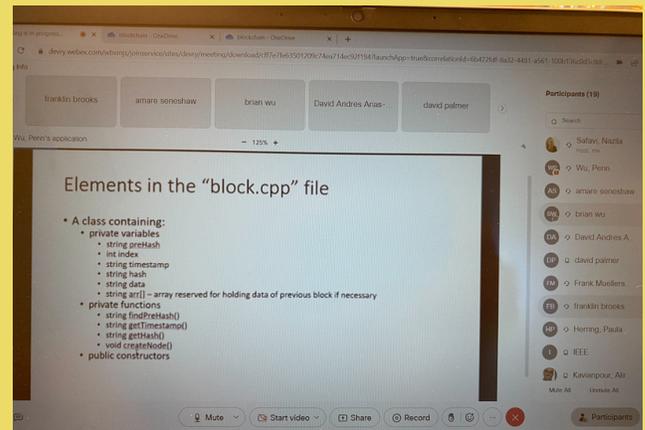
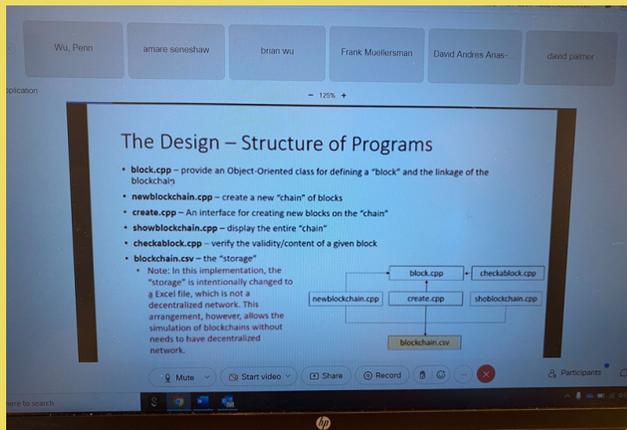
The average cost for each kit, excluding labor and electricity, is \$15 to produce. Due to the need for 50 kits and electricity, the total cost for all the raw materials required to make the product was \$750. With the generous contribution from Maury Microwave, the IEEE Foothill Chapter, and CPP IEEE, we were able to fund the entire workshop. With the additional soldering equipment purchased (\$400), the final amount of funding used to hold the workshop was \$1,286.87. Through the development, design, and production of the Blinky Learner Soldering Kits, we provided 40 students with the opportunity.

To learn soldering during the workshop held on March 25th, 2022. We prepared the students to understand the concepts behind the circuit they would be putting together and taught them essential skills on soldering safety and successful soldering. Although we had some obstacles to cross on our journey to completing logistics for the workshop, we saw high engagement from the participants and enjoyment overall. Therefore, we can learn from this experience and improve our skills to host better and more extravagant workshops.

We want to thank Dr. Yu for her outreach and advisory skills. We would also like to thank our sponsors for their generous contribution to providing students with resources and hands-on activities. These sponsors are Maury Microwave Co., the IEEE Foothill Section, and the IEEE Nanotechnology Council (NTC). In addition, we would like to thank Dr. Ceylan and Prof. Herder for their excellent communication and assistance with the soldering workshop funding and logistics. Finally, we thank all the CPP students that participated in the first soldering workshop since the stay-at-home orders. Thank you for all your support!

## Building a Simple Blockchain

Prepared by: [Penn P. Wu, PhD](#)



Blockchain is commonly defined as a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a non-centralized business network. The technology stores data in the form of a well-defined block and is now commonly used to store data for cryptography and cryptocurrencies such as Bitcoin. In 1991, Stuart Haber and W. Scott Stornetta introduced this concept using a linked list where the nodes are the blocks in the Blockchain, and the references are hashes of the previous block in the chain. This prototype also defines references as cryptographic hashes. The blockchain then works as a transparent ledger. This workshop will provide an opportunity to build a simple blockchain with little coding effort. The objective is to understand what it takes to make a blockchain. The instructional goal is to encourage students to take action to explore, discover, understand, and develop their blockchain.

About Dr. Wu, he has been teaching at DeVry University since 1999. He mainly teaches technical courses at both graduate and undergraduate levels. Dr. Wu holds a doctoral degree in Information Systems from a research university. He developed a habit of writing research papers, frequently published in academic journals and conference proceedings. It can fulfill his professional development requirements, letting him approach new knowledge domain skills.

# Autonomous Flight of Endurance UAVs to Monitor Powerlines

Prepared by: CPP Students



Fig. 1. Off-The-Shelf Volantex ASW-28 RC Testbed.



Fig. 2. Off-The-Shelf Storm Drone-4 Quadcopter Testbed

We developed a highly efficient UAV (Unmanned Aerial Vehicle) architecture for long endurance flights in this project. We proposed an IoT (Internet of Things) model that will connect a network of drones using a 4G LTE (Long Term Evolution) connection. We suggest using MEC (Mobile Edge Computing) stations, smart GCSs (Ground Control Stations) for battery replacement, and wireless charging via powerline magnetic field harvesting. We will be applying these ideas to a powerline monitoring mission profile, creating an extensive sensor network with computer vision capabilities to detect powerline faults and report them to the proper authorities.

For more of this write-up click the link: [https://drive.google.com/file/d/1wljxEU6B\\_rINFMFhwL8k1S2EpgzuBQzi/view?usp=sharing](https://drive.google.com/file/d/1wljxEU6B_rINFMFhwL8k1S2EpgzuBQzi/view?usp=sharing)



The IEEE Foothill Section received its certificate for being one of the co-sponsor of the successful WTS 2022 (Wireless Telecommunication Symposium). *For more of the certificates, see next page.*

## Upcoming Events:

- IEEE Foothill ExCom/OpCom  
May Monthly Meeting  
May 10, 2022
- Foothill Consultants Meeting  
May 25, 2022

## Social Media:



<https://www.facebook.com/ieeefoothill>



<https://www.linkedin.com/groups/13516173/>

# Wireless Telecommunication Symposium 2022 Certificates

