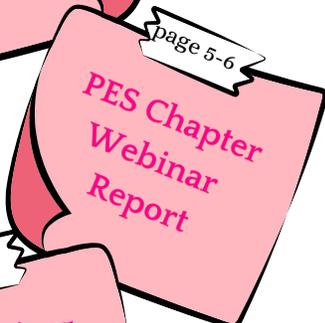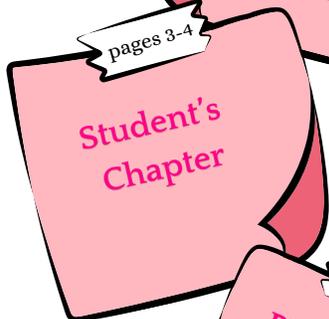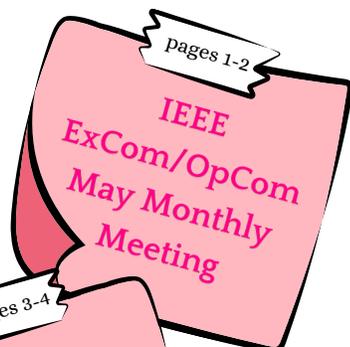# IEEE FOOTHILL
MONTHLY NEWSLETTER

What's Inside

This newsletter is brought to you by:

Panatron Inc

IEEE Foothill May ExCom/OpCom Monthly Meeting

Prepared by: Max Cherubin | Proofread by: Prof. Gerald Herder

The IEEE Foothill Section held its May ExCom/OpCom monthly hybrid meeting at DeVry University and virtually through Zoom. The chair reviewed the minutes, and some members corrected them. Some names of the virtual attendees were not listed. He also mentioned Amal Altahi's intention to have a Computational Intelligence Society for the section and asked the secretary regarding the status of his IEEE credit card.

Membership Development

Kim Mosley was supposed to give a report, as the chair allotted an earlier time for her, but she still couldn't. However, she emailed the chair a week before the meeting about the membership status. She was working with two members who wished to elevate. They are Bassem Maurice (Computer Society Interim-chair) and Amr Magdy (a professor from UCR). Since the beginning of the year, we have had 69 new members join, of which 12 are member grade and the balance student/graduate student. Of course we often have the non-renewal drop off after the first of the year as well. Although this year-end starts are 986 to 820 (166), it is not as great a drop as it has been in the past. There has been no update regarding newly elevated senior members since January.

Social Media and Website

Osman Ceylan, there are no new members in our LinkedIn account. Our Facebook account is still suspended for an unknown reason, which the vice-chair is investigating. We always remind the section to post their events or activities to the section page.

He also shared information about the Region 6 Area Meeting on May 11th, which he and the secretary, Prof. Gerald Herder, attended. The presentations were all about treasurer updates, Young Professionals, Educational Systems, Women in Engineering, and Life Members.

Region 6 covers the Buenaventura Section, the Central Coast Section, China Lake, Coastal Los Angeles, and Foothill sections.

Technical Societies and Committees

Scott Wedge reported. The Design Automation Conference is June 23 to 27 at Moscone Center, and there will be many activities at the Marriot Marquis. IMS will be in Washington, DC, from June 16-21, 2024. Osman Ceylan is involved in some of the student activities, including the Student Design Competition. Osman and Jerry attended the inaugural online MTT World Microwave Conference (WMC). The WMC videos are now available on YouTube at the IEEE MTT channel. You will see almost 320 presentations. Some of them have had general topics and features of RF and microwave, and they also had session opportunities.

For Nanotechnology, Addie Hasson reported on the Hyperloop Workshop and shared that Hyperloop had some issues with the club. It's not final yet, but the club will likely not continue. The chair will clarify this for Dr. Jenny Yu, who was absent during the meeting.

For ComSoc, there were three events for the chapter. First, WTS 2024. Steven Powell, the chair of the symposium for 20 years, decided this year to step down and retire from sharing the conference and will no longer continue. The conference was sponsored by the College of Business at CalPoly Pomona. There is an entity in CPP-Pomona that covers the accommodation and registration of the attendees in terms of the technical co-sponsoring that was done through IEEE. Dr. Tamer Omar is thinking of sponsoring this kind of event, and the section may want to talk about it. Sponsoring this event will eventually hit the related perspective of engineering, business, and computer science, which are all related to wireless telecommunication. Next was the IoT Arcade Car Race last April 19, 2024, with the CPP and CBU student branch. They had a total of 50 attendees. It was a successful event and a chance for students to showcase their cars. Dr. Omar also mentioned the Emerging Technologies Proposal Application, which is $25,000.00.

For the Computer Society, they had joint events with the Alabama Section last May 06, with a total of 45 attendees. They learned that there was an organization reporting to Homeland Security that would help any small businesses in adopting best practices for cyber security, which is helpful. On the website, you can see the contact person of the sponsors. They review your security measures for the business. They also provide tools that are normally very expensive, but it's available for small businesses for free in order to secure their information, which is their IP. Last May 13th, Quantum Technologies was sponsored; Dr. Angie Qarry provided a very dense presentation on quantum technologies and the latest in space in terms of securing security. The whole topic is about security and encryption, and she summarized it well. There were 12 attendees.

PES, Koji Yamashita, reported regarding their event last May 15, 2024. It was about Grid-Code and Demonstration Trends related to GFM Inverters. Discussions on rules, requirements, and specifications are underway in Europe, the U.S., Australia, etc. Implementation is progressing from demonstration to operation. In Europe, ACER is considering mandating GFM through the Grid Code, with the intention to issue the Code in 2024. The U.S. and Australia have developed and published their GFM requirements and specifications, and multiple demonstrations are underway to introduce GFM. (*see more of these on the next pages...*)

Affinity Group

YP, Pankaj Bhowmik, the interim chair, was not present during the meeting but was able to send an email to the chair prior to the meeting. He was traveling internationally, and as far as the chapter goes, they were able to successfully host UC-Riverside in their company, TAE Technologies, for an industrial tour last May 10 for the students. He will report further about this to next month's ExCom/OpCom.

As for the Consultant's Network, Cash Sutton was not present; however, the section had its monthly meeting on May 1, 2024. Their next meeting will be on June 05, 2024.

Student's Chapter

Reported by: Melissa Castro

Currently they are in the middle of officer election. They also finished multiple workshop like the RC Car which will continue on for the next semester. They were also done taking professional headshots for their LinkedIn Accounts. One of the officers will be hosting Mixers somewhere in Rancho Cucamonga.

Reported by: Prof. Neda Adib

Prof. Neda Adib had a Networking last May 11, and the Robotics Meeting last May 10. They also had an Intelligence Meeting last May 08. They will hold a competition similar to IEEE Xtreme but exclusive only to DeVry University students, the Hackathon. Prof. Penn Wu asked if the section could fund this activity and the target date will be on July 7th. They want to know what needs to be done to get funding from the section. The chair told them to write a proposal and he will send them the sponsorship form.

Reported by: Addie Hasson - Hyperloop Secretary
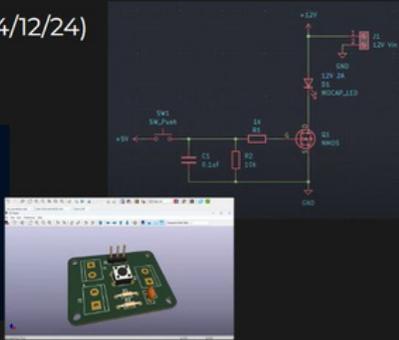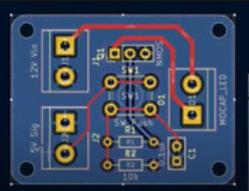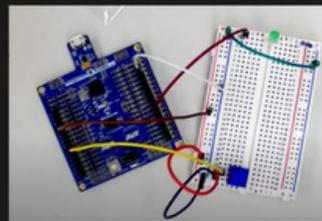

CPP: Autonomous/RC Car Race and IoT Arcade:
Reported by: Dr. Tamer Omar

The IEEE Foothill ComSoc Chapter, IEEE CPP, CSUSB, and CBU Student Chapter the second Autonomous/RC Car Race and IoT Arcade Competition and showcase. During the events students from all universities and IEEE ComSoc members competed on Autonomous/RC Car Race and an IoT Arcade. The event started at 12:00 pm on April 19 at CalPoly Pomona engineering meadow. Competing projects show student experiences in creating autonomous plant surveyor and hydrator, beverage brewing and fermentation machine, air quality monitoring system, game controller, dual-axis solar tracking system, and greenhouse monitoring system. In addition, to the remote pilotless vehicles competed in the car care. Pizza was served for the event attendees. The event was great full of education, communication, and fun.

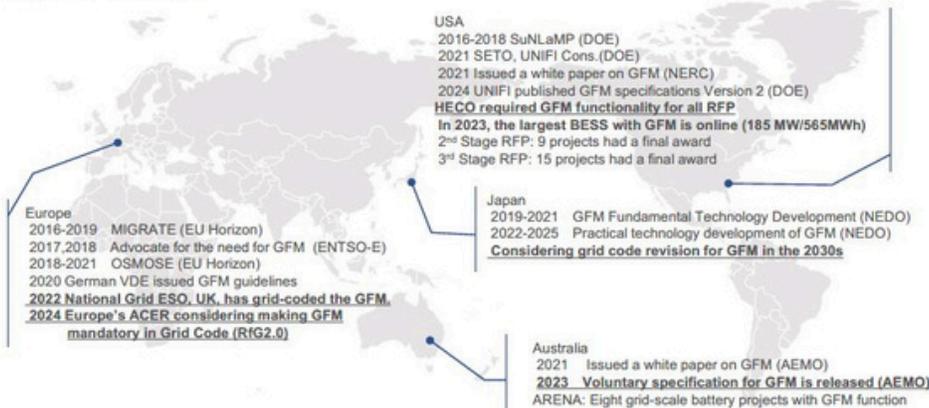# CSUSB-CSE and WiE: Reported by: Melissa Castro

Hosted an RC Car Workshop as part of a multi-part series that has students get familiar with Arduino Uno, soldering, circuit building, and other essential skills for building their own RC Car. There were about 15 students in attendance, and each had some time to work on their projects as a team.
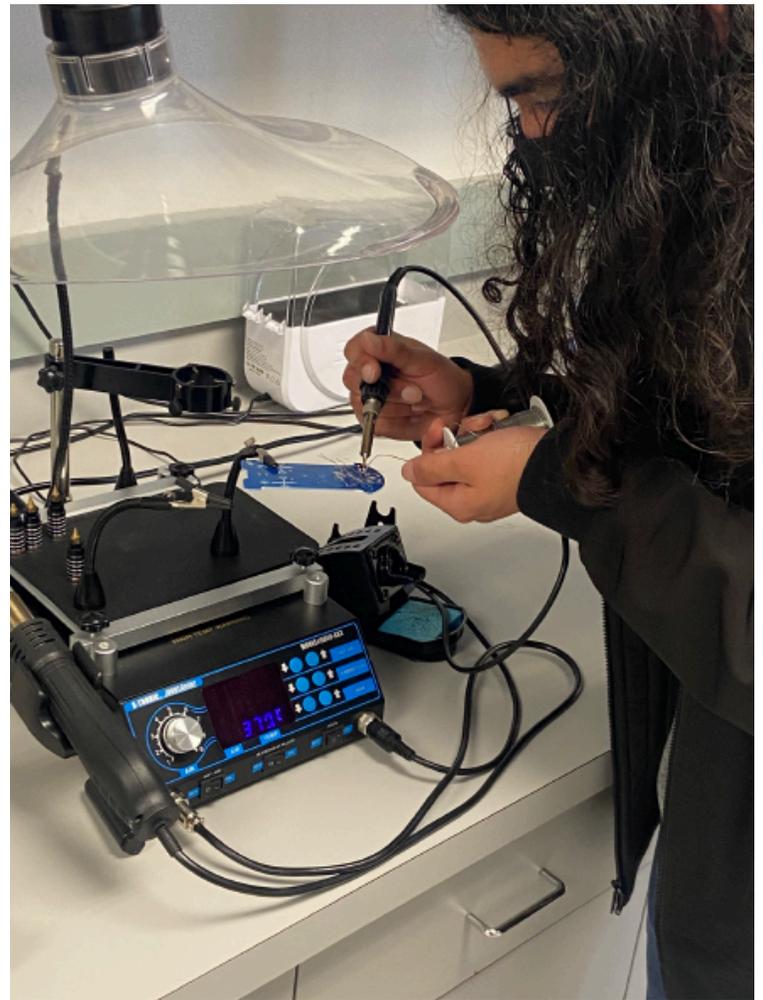
2. Global trend in GFM inverter

Grid-code and Demonstration Trends Related to GFM Inverters

- Discussions on rules, requirements, and specifications are underway in Europe, the U.S., Australia, etc. Implementation is progressing from demonstration to operation.

- In Europe, ACER is considering mandating GFM through the Grid Code, with intention to issue the Code in 2024.

- The U.S. and Australia have developed and published their GFM requirements and specifications, and multiple demonstrations are underway to introduce GFM.

USA
2016-2018 SuNLaMP (DOE)
2021 SETO, UNIFI Cons.(DOE)
2021 Issued a white paper on GFM (NERC)
2024 UNIFI published GFM specifications Version 2 (DOE)
HECO required GFM functionality for all RFP
In 2023, the largest BESS with GFM is online (185 MW/565MWh)
2nd Stage RFP: 9 projects had a final award
3rd Stage RFP: 15 projects had a final award

Europe
2016-2019 MIGRATE (EU Horizon)
2017,2018 Advocate for the need for GFM (ENTSO-E)
2018-2021 OSMOSE (EU Horizon)
2020 German VDE issued GFM guidelines
2022 National Grid ESO, UK, has grid-coded the GFM.
2024 Europe's ACER considering making GFM mandatory in Grid Code (RfG2.0)

Japan
2019-2021 GFM Fundamental Technology Development (NEDO)
2022-2025 Practical technology development of GFM (NEDO)
Considering grid code revision for GFM in the 2030s

Australia
2021 Issued a white paper on GFM (AEMO)
2023 Voluntary specification for GFM is released (AEMO)
ARENA: Eight grid-scale battery projects with GFM function

3.2 Japan's global facility for interconnection testing

FREA Smart Systems Research Facility Enhancement

- Opened at FREA in FY2016 as part of the 'Global Certification Infrastructure Development Project of METI' from the FY2013 supplementary budget.

- Expansion work is scheduled to be completed in FY2023 under the 'International Standard and Certification Center Development Project for Promoting Carbon Neutrality of METI,' funded by the supplementary budget for FY2021. The facility will be available for use from FY2024.
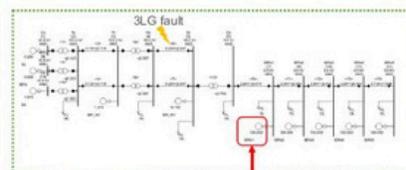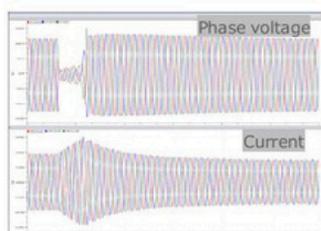

Rendering of the Smart Systems Research Facility Phase 2 (from April 2024)

Interconnection Test M Room

7.5 MVA Grid simulator and 5 MW load bank

3.2 Japan's national project; NEDO STREAM

PHIL test confirmation results

- The PHIL test reproduced various system disturbances and completed the initial scrutiny regarding the dynamic behavior of the prototype machine under test following a system disturbance.

- Three-phase ground fault (3LG) testing was performed with a PHIL on a GFM inverter.

Test No. 1-B-1-3LG
Transmission line <8> ground-fault
→ fault duration of 70 ms (fault type: 3LG)

Phase voltage

Current

3LG fault
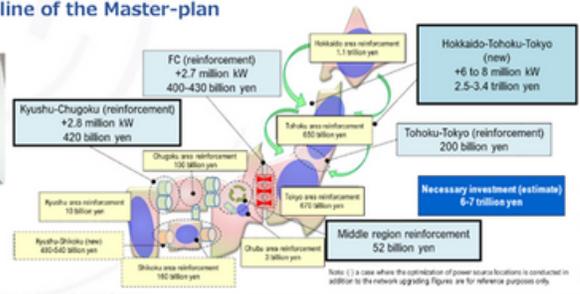
GFM inverter prototype

Figure: PHIL test of GFM dynamic behavior following a system disturbance with one line open after a 3LG fault.
The interconnection point is electrically 1 km away from the distribution substation serving the load feeder (IBRd1)

Virtual sector
DRTS (NovaCor)

Physical (Hard) Sector
GFM inverter (50kVA)

6

The IEEE PES Foothill Seminar, titled "Overview of NEDO Stream R&D Project for System Stability Aimed at Mass Introduction of Renewable Energy," was held online on May 15, 2024. Mr. Ryuichi Ogahara from the New Energy and Industrial Technology Development Organization (NEDO) and Dr. Jun Hashimoto from the National Institute of Advanced Industrial Science and Technology (AIST) presented an overview of a national demonstration project in Japan, highlighting preliminary results.

The first speaker discussed the current status and future goals of inverter-based resource (IBR) integration in Japan, specifically emphasizing the decreasing grid inertia due to the increasing use of IBRs. The second speaker explored projects involving grid-forming converters and motor-driven synchronous generators powered by renewable energy sources with batteries. He presented new findings regarding a unique current feature of grid-forming converters during a system fault, which will be leveraged for the upcoming update of Japan's grid interconnection code.

A total of 13 participants attended this webinar. During the discussion segment, speakers and the audience elaborated on the limitations of synthetic inertia and fault current provision provided by IBRs, contrasting these functionalities with those of conventional synchronous generators, including grid-forming converters. The seminar was not recorded, but presentation slides are available in PDF format upon request. Interested individuals can contact Dr. Koji Yamashita at kyamashi@ucr.edu to acquire the presentation material.

UPCOMING Events

IEEE July ExCom/OpCom Monthly Hybrid Meeting

July 09, 2024

IEEE Consultants Network Meeting

July 03, 2024

WE WELCOME VOLUNTEERS

If you want to be part of our section, email us at sec.foothill@ieee.org.