COPE: Committee on Promoting Equality

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In this very first "COPE Corner" column of 2021, I would like to welcome the IEEE Committee on Promoting Equality (COPE) members and express gratitude to them for volunteering their time during the COVID-19 pandemic for the benefit of the IEEE Antennas and Propagation Society (AP-S). On 14 January 2021, Prof. Weng Chew and Dr. Ajay Poddar organized the first COPE Zoom meeting, an initiative aiming at promoting equality in gender, income, and race by promoting access to knowledge. This will help to create opportunities by bringing high-quality, specialized knowledge to an unequal but promising Region.

In summary, COPE will promote equality by leveraging access to opportunities in science and technology for the benefit of community. The way forward discussed on 14 January 2021 in the COPE meeting is to involve the IEEE Chapters, Special Interest Group on Humanitarian Technology (SIGHT), Member and Geographic Activities Committee, and Education Committee for reaching short- and long-term goals. In addition to this, interaction and partnership with IEEE Engineering Projects in Community Service; IEEE

Young Professionals; the United Nations (UN) Education, Scientific, and Cultural Organization; and the UN Social Justice Organization were recommended during the discussion session.

Figure 1 shows the COPE members selected from different Regions. The AP-S Chapter Activity Committee (CAC) will be actively participating and interacting with COPE members and engaging AP-S Region coordinators as well as local IEEE Section and Chapter officers to ensure that the diversity of the community is represented in all aspects of the Chapter officers' and volunteer leaders' organizations, as per the COPE directives and goals.

In general, Chapters are required to elect/select two to six officers (a Chapter chair, cochair, vice chair, secretary, treasurer, and webmaster). The CAC will send an email request to Region coordinators as well as local IEEE Sections and Chapters to promote equality in the next election of Chapter officers. The CAC can also help in creating an inclusive local regional speaker database, similar to a speaker bureau, where members and volunteers can actively sign up and be called upon to serve within their technical and/or professional subject areas. Local Chapter chairs and volunteer leaders can use this database to recruit speakers for invited talks, keynotes, panels, humanitarian subject matter, and the promotion of equality.

These steps will help the CAC in promoting an inclusive and equitable culture in its Chapter activities and programs that welcomes, engages, and rewards those Chapters that contribute to the COPE mission. Chapters will be recognized for humanitarian projects

that promote equality and receive an additional US$500 in financial support.

On behalf of COPE, I encourage AP-S members to engage with their local Chapters and Sections and submit proposals for funding COPE activities in their local communities. Proposals can be submitted to Prof. Weng Chew (wcchew@purdue.edu), chair of COPE, and Dr. Ajay Poddar (akpoddar@ieee. org), chair of the CAC, for the approval of financial support for organizing COPE activities. Keeping in view the current unprecedented conditions due to the global COVID-19 pandemic, the
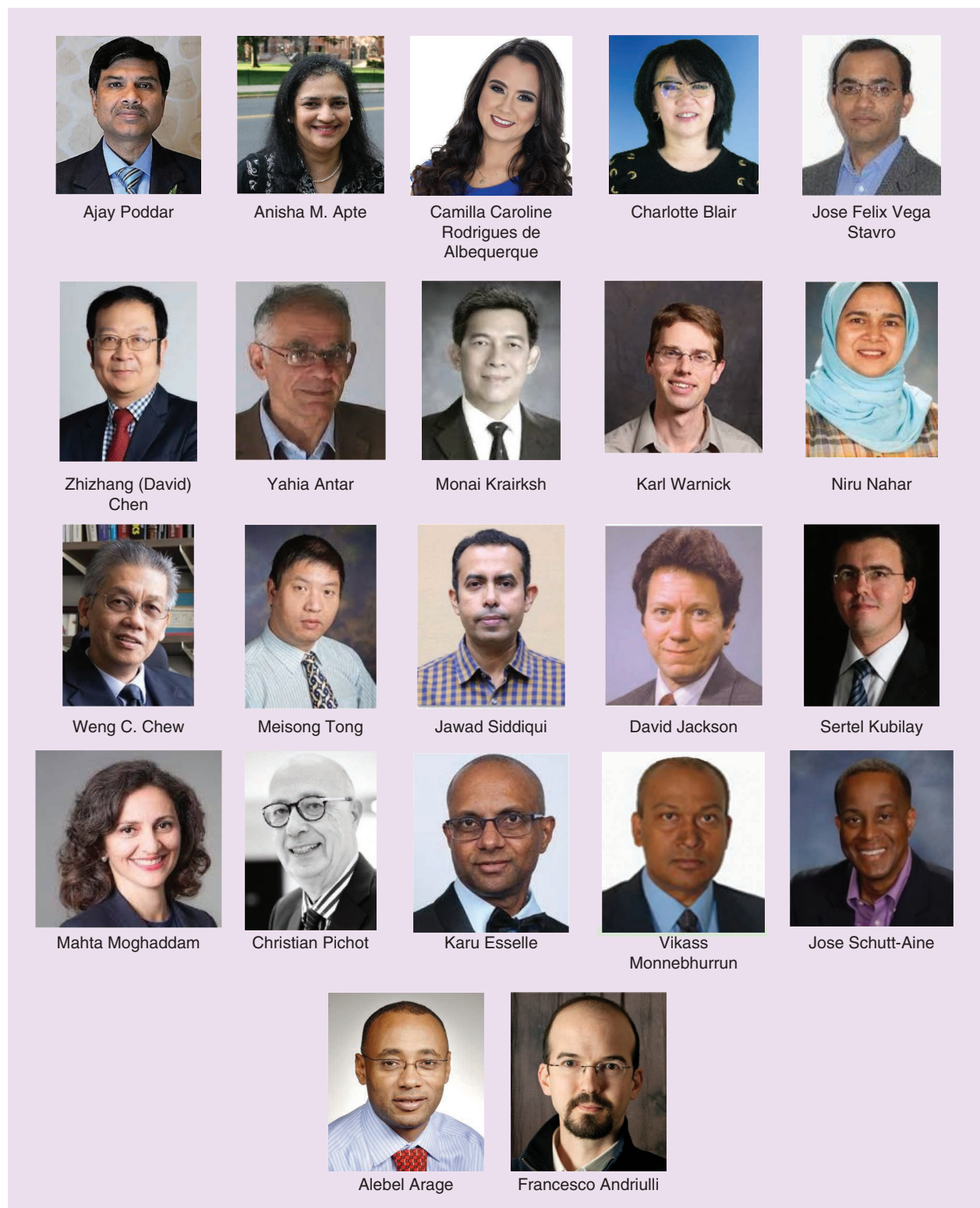

FIGURE 1. The members of AP-S COPE.

submission deadline is extended to 31 August 2021.

Today, technology has captured the global playing field. Thanks to this advancement, earning a living does not mean hunting in jungles and plucking from trees. Technology has improved standards of living and continues to progress quality of life.

While IEEE's tagline, "Advancing Technology for Humanity," should establish its resolutions, unfortunately, there is a substantial portion of the population that does not have access to some of the basic necessities, such as clean water, electricity, the Internet, mobile phones, and others, that many of us take for granted. Provision of these basic things to improve quality of life is considered to be a "human right." The COPE platform is an inspiration to understand the global humanitarian challenges and also, through other programs, such as IEEE SIGHT, to apply engineering capabilities to explore low-cost solutions for improving the quality of life in underserved regions of the world.

Everyone would agree that education is the best way to right these inequalities. Relevant to our profession, expanding science, technology, engineering, and mathematics (STEM) education can help to overcome these problems, as it would promote a technology economy. It seems that the best way to promote STEM education is via our Chapters and Sections. Meanwhile, it could be that we will not have the resources to solve this gargantuan problem, but we can seed activities that leverage other approaches.

Many problems we face, like gender and racial inequality, are deeply rooted in our society and quite visible even at the grade and high school levels, as they are embedded in culture. If we can pique the interest of underrepresented minorities and women in STEM education at the grade and high school levels, we can expect to see a good pipeline of students interested and willing to study engineering-related fields. Many ways to address these goals are discussed here.

One approach is to fund university activities via IEEE Chapters. These can, in turn, stimulate STEM education by working with high schools and grade schools. Hence, our minuscule resources can be put to good use to fund activities that can have a far-reaching impact. These activities can leverage the offerings from industry and government. It is also important for us to energize the Chapters to engender a feeling of ownership of these problems.

Another way is to engage college students to work with middle school/high school kids on simple projects like radios. In addition to being exposed to science beyond their current levels, students in schools might feel more comfortable learning from college students rather than professors. College students also will learn mentoring, and they might be able to recruit students for STEM degrees in a more amicable environment.

We want to initiate programs that solve local needs, e.g., global warming, pollution, severe natural disasters, and so on. The emphasis of these projects should be on both hardware and software.

Oftentimes, such projects/events are accessible to students who are socioeconomically privileged, and we need to make an effort to reach those who are underprivileged/underrepresented. It has become common to find that most underprivileged kids (or their parents) do not have access to key information about the opportunities a STEM degree can bring in terms of breaking the vicious cycle of poverty and providing financial security for life. Reaching out to those groups with relevant information is sometimes the most important task we can take up.

Simple messages, like the following, might work:

- STEM skills sell easily and can be used worldwide.
- Innovation drives the global economy.
- Entrepreneurship is the key to a sustainable economy.

It is very important for underprivileged kids to see their way out of poverty through STEM. They cannot afford to do science just for passion. Privileged kids are found to opt for other, lighter subjects to pursue or get a degree in, as STEM is too hard!

Several interesting projects can prove to motivate young minds to take up STEM-related fields of study, such as the few mentioned here:

- monitoring systems for disaster prevention (such as fires, landslides, snowstorms, and floods)
- water-quality sensors and sensor networks
- wireless Internet for remote areas
- fast development of wireless systems in emergency situations.

Underserved communities in our Regions would be able to benefit from technology as they seek sustainable solutions to development challenges.

It is the need of the hour to foster technological innovation and excellence for the benefit of humanity and lead humanitarian efforts with the involvement of and partnerships with local industry, using technology to solve the world's most challenging problems. It is imperative to work on developing programs in public service focused on knowledge and technology in our fields of interest related to public policy and humanitarian efforts.

The IEEE Humanitarian Activities Committee supports the IEEE Board-endorsed vision of IEEE volunteers around the world carrying out and/or supporting impactful humanitarian activities on the local level. A network of IEEE volunteers around the globe can partner with underserved communities and local organizations to leverage technology for sustainable development.

Judging the impact of prevailing and evolving technologies on people and humanity is a difficult mission. Such a task requires a cross-disciplinary partnership among scientists, academicians, engineers, medical practitioners, and legal scholars.

The joint collaboration among the IEEE sister Societies undertaking COPE projects at various levels, such as schools, colleges, and universities, will create awareness among the new generation about the major problems faced by humanity in the current times. This will, in turn, create the necessary interest and result in brainstorming ideas using

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technological advances to address these problems and become a part of the solution. Various issues, such as the following, can be addressed.

Land, air, and water are all resources that living species need for survival, and these are currently being polluted at high rates. According to World Health Organization (WHO) data, nine out of 10 people breathe air that contains high levels of pollutants and exceeds WHO guideline limits, with low- and middle-income countries suffering from the highest exposures. Our COPE members can collaborate with SIGHT, the UN, and WHO and organize various seminars to create awareness among the next generation.

Extreme weather events, such as hurricanes, heavy downpours, floods, blizzards, heat waves, and droughts are often linked to climate change. According to the Center for Climate Sciences at NASA's Jet Propulsion Laboratory, "while there's not yet a full consensus on the connection between climate change and extreme weather events," in recent years, a body of evidence linking extreme weather with climate change has begun to emerge. Evidence from satellites, aircraft, ground measurements, and climate model projections is increasingly drawing connections.

As part of the COPE initiative, members can not only create awareness of these problems but can conduct ham radio workshops that will empower people to be equipped with emergency communication means and, at the same time, enable us to promote the significance of STEM education among them. Engineering, also known as a _noble pursuit_ and an _essential profession_, is, in general, facing a tough environment. IEEE's tagline, "Advancing Technology for Humanity," stimulates us to proceed in a direction to invent and apply the technology needed to meet the basic needs found in underserved regions of the world.

As STEM professionals, our COPE community can conduct workshops and seminars as well as sponsor student projects focused on the issues at hand. Such projects will provide hands-on experiences to participants and trigger interest in STEM-related studies. Students from underserved and underprivileged parts of society can freely participate in such events, thus gaining access to the field and promoting equality by providing an equal opportunity to all.

In summary, there are several ways to mitigate the variety of inequalities found in today's global society. Technology can essentially not only offer a helping hand but prove to be the key catalyst in this process of restructuring our society and making this beautiful planet a better living environment for every life that calls it _home_.