

## COMSOC STANDARDS DEVELOPMENT, AND STANDARDIZATION PROGRAMS DEVELOPMENT

IEEE Communications Society participates and promotes development of technological standards in its entire field of interest, within the collective scope of its Technical Committees, Emerging Technologies Initiatives, and Industry Communities. In this issue of the President's Page, I am pleased to introduce Edward G. Tiedemann, Director of Standards Development, and Nada Golmie, Director of Standardization Programs Development, who share with us the goals of the Standards Development Committee and the Standardization Programs Development Committee for promoting standards development and for engaging the global technical communities, especially the industry communities.

Dr. Edward G. Tiedemann, Jr. is an IEEE Fellow, a Qualcomm Fellow, and a Senior Vice President of Engineering of Qualcomm Technologies, Inc. He leads Qualcomm's worldwide standardization and industry organization activities. Dr. Tiedemann was instrumental in the design and development of the TIA/EIA/IS-95 CDMA system, also called cdmaOne™. He has been active in every generation of mobile standards since then. Dr. Tiedemann holds a Ph.D. degree from MIT, where he worked in the areas of queueing theory and communications networks. He holds a Master of Science degree from Purdue University and a Bachelor of Science degree from Virginia Polytechnic Institute and State University (Virginia Tech). Dr. Tiedemann is past Chairman of the Advisory Board of the College of Engineering at Virginia Tech. He currently sits on the Advisory Board of the Purdue University School of Electrical and Computer Engineering, the Hong Kong University of Science and Technology (HKUST) School of Engineering Advisory Committee, and the International Advisory Panel of the Singapore Future Communications Research & Development Programme. He currently serves the IEEE Communications Society as Director, Standards Development. He is also a member of the Board of Advisors of the Peabody Essex Museum and a member of the Board of Trustees of the Concord Museum.

Nada Golmie (nada@nist.gov) received her Ph.D. in computer science from the University of Maryland at College Park. Since 1993, she has been a research engineer at the National Institute of Standards and Technology (NIST). From 2014 until 2022, she served as the chief of the Wireless Networks Division at NIST. She is an IEEE Fellow and a NIST Fellow in the Communications Technology Laboratory. Her research in media access control and protocols for wireless networks led to over 200 technical papers presented at professional conferences, journals, and contributed to international standard organizations and industry led consortia. She is the author of *Coexistence in Wireless Networks: Challenges and System-Level Solutions in the Unlicensed Bands* (Cambridge University Press, 2006). She leads several projects related to the modeling and evaluation of future generation wireless systems and protocols, and serves as the NextG Channel Model Alliance chair.

Standardization plays an important role in communications. Many of you are likely familiar with the names of many standards organizations that create standards for communications such as the 3rd Generation Partnership Project (3GPP) for the various cellular generations, IEEE 802.11 for Wi-Fi and Bluetooth, USB-IF for wired interfaces for laptops and cell phones, the Internet Engineering Task Force (IETF) and W3C for Internet protocols, and the International Telecommunication Union (ITU), a specialized agency of the United Nations. Many ComSoc members participate in these organizations, which create industry specifications or standards. Less known is that the IEEE Communications Society sponsors many standardization efforts. These fall under the IEEE Communications Standardization Board (COM/SDB), chaired by Ed Tiedemann. Underneath COM/SDB are eight standardization committees and one active independent Working Group. The standardization committees are AccessCore chaired by Alex Gelman, AerCom chaired by Haiying (John) Lu, DySPAN chaired by Oliver Holland, EdgeCloud chaired by Rob Fish, GreenICT chaired by Jaafar Elmihghani, MobiNet



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chaired by Oliver Holland, NetSoft chaired by Mehmet Ulema, and PLC chaired by JP Faure. Perhaps the most well-known work is that done by Power Line Communications (PLC). The most recently formed committee is AerCom focusing on applications, command, control, and communications for unmanned aerial vehicles (UAVs), also called drones. Last year, project P1952, Standard for Resilient Positioning, Navigation and Timing (PNT) User Equipment was approved and is under NetSoft. These are just a few of the active projects. You can find out more about these standardization committees at <https://comsdb.standards.comsoc.org/>, and in particular at <https://comsdb.standards.comsoc.org/working-groups/>.

Technology standards — those of prime interest to those in ComSoc — are usually developed to address a business need, although often with newly emerging technology areas the actual business may still be quite nebulous. A common type of standard in communications is an interoperability standard, which specifies operational protocols or application programming interfaces (APIs) between equipment or entities. Standards are also created for definitions, requirements, system architectures, and performance — the latter often specifies a minimum performance requirement for equipment. Standardization in IEEE falls under the auspices of the IEEE Standards Association (IEEE SA), which sets the basic rules for standardization. Properly following these rules enables collaboration in standardization with significantly less risk of running afoul of anti-trust or anti-competition issues.

In IEEE, it is relatively easy to begin a standardization project, which is based upon a Project Authorization Request (PAR). Among other things, a PAR has the scope of the proposed standardization project and a justification of the need for the standard. A key aspect is to organize a group of companies or individuals willing to participate in the project. For this reason, many standardization projects begin with discussions in the Technical Committees or in the Standardization Program Development Board (SPDB) led by Nada Golmie, which explores gaps and needs in the standardization development landscape.

A recent example of a project incubated in the SPDB is the Channel Modeling and Standardization Group (CMSG) that started as an ad hoc group in SPDB in 2021. CMSG, chaired by Andi Molisch and Naveed Abbasi, aims to establish recommendations for channel parameters, models, and standards to address gaps in existing standardization efforts. The vision for this new standard is to complement existing wireless channel standards developed by organizations such as 3GPP, ITU, and IEEE 802.11/15. These wireless channel standards are typically developed for the purpose of comparing system proposals under very specific conditions while considering computational complexity and backward compatibility. The efforts undertaken by the CMSG group aim to complement existing activities, including those underway within the NextG Channel Model Alliance, by working on a number of new directions such as the development of channel models for massive and distributed multiple-input multiple-output (MIMO), the Internet of Things (IoT), extended mid-band frequencies (< 6 GHz bands), UAV and vehicular channels, generative machine learning (ML) models, THz channels, and site-specific channel representation. Ultimately, the goal is to provide guidelines to researchers about possible models and standards, typical channel parameters for a number of environments, and running code for such models. In addition, this will provide a baseline of models for future standards activities. The group is currently finalizing a draft PAR for review in COM/SDB.

We hope that you find the preceding ComSoc programs and activities relevant to your work and to your technical areas of interest. We encourage your active participation and we thank you for your contributions, which will benefit both technological innovations and the global community.