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Special Session on
Signal Processing, Sensing and Communication for Connected and Automated Vehicles

Name and affiliation of organizers:

Dr Sujan Rajbhandari
Institute of Photonics, Strathclyde University, UK
sujan.rajbhandari@strath.ac.uk

Dr Sujan Rajbhandari (SMIEEE) is a Senior Lecturer at Strathclyde University, where he is working in the field of optical wireless communication. He received his PhD from Northumbria University in 2010. Between 2009 and 2012, he worked as a senior research assistant and research fellow at Northumbria University. In 2012, he joined the communications research group at the University of Oxford. He worked in the EPSRC's funded Ultra-parallel visible light communications (UP-VLC) project, which was a collaboration of five UK's leading Universities (Oxford, Cambridge, St Andrews, Edinburgh and Strathclyde). He then undertook lecturer and senior lecturer in electrical and electronic engineering at Coventry University before joining Huawei Technologies, Sweden, in 2020. Between May 2021 and July 2023, he worked as a Senior Lecturer at the DSP Centre of Excellence, Bangor University, leading research and commercialisation activities on optical wireless communication. He is a senior member of IEEE and an associate member of the Institute of Physics.

Dr Bo Tan
Tampere University, Finland
bo.tan@tuni.fi

Dr Bo Tan received his PhD from The University of Edinburgh, UK, in Nov 2013. From 2012 to 2016, he conducted multiple postdoctoral research projects at the University College London and the University of Bristol, UK. From 2017 to 2018, he was a lecturer at Coventry University, UK. Since 2019, he has been a tenure-track assistant professor at Tampere University, Finland. His research interests include radio sensing and connectivity for intelligent machines. He is the PI and coordinator of the projects on signal processing and machine learning techniques for radio sensing and communications in drone swarming, airport surveillance, healthcare, and 6G, funded by the Academy of Finland, Business Finland, and Horizon European. He is the vice chair of the IEEE Finland AP/ED/MTT Chapter, associate editor of IEEE Wireless Communications Letters, and reviewer of multiple IEEE/ACM/IET journals and conferences.

Dr Seongki Yoo
Centre for Future Transport and Cities, Coventry University, UK
ad3869@coventry.ac.uk

Dr Seongki Yoo is an Assistant Professor at the Centre for Future Transport and Cities, Coventry University, where he is working in the field of wireless communication for connected and automated vehicles (CAVs). He began his research career as a junior researcher with the Korea Electrotechnology Research Institute, Republic of Korea (2012-2013). He then obtained his PhD in Wireless Communications from Queen's University Belfast, UK (2017), which was sponsored by the UK Engineering and Physical Sciences Research Council (Grant No. EP/H044191/1). He was then employed as a post-doctoral researcher within the Centre for Wireless Innovation, ECIT Institute, UK (2017-2019). He worked on the US-Ireland project entitled 'Enabling Cellular Networks to Exploit Millimeter-wave Opportunities' supported by the NSF in the US, the SFI in Ireland and the Department for Employment and Learning Northern Ireland (Grant Reference USI080).

Scope of the session

Connected and automated vehicles (CAV) are a paradigm-shifting transportation concept with great potential to reshape future transport systems. Several advancements in CAV have been achieved in recent years that enabled a high level of autonomous driving. The key technologies underpinning the CAV are signal processing, sensing, communication, and artificial intelligence. The focus of the special session will be on the recent advancement in critical technologies for CAV, including (but not limited to) advanced signal processing, radio and optical communication, sensor development and fusion, environment and pedestrian detection, and artificial intelligence.

Prospective authors are invited to submit original and unpublished work on the following research topics:

- *Advanced signal processing and communication*
- *Radio and optical sensing for vehicles*
- *Multi-sensor fusion*
- *Fusion of communications and sensing*
- *Machine learning and artificial intelligence*
- *Environment and Pedestrian detection*
- *Human-machine interaction*
- *Localization and mapping*
- *Security for vehicular communication*
- *Hybrid radio and optical communication for CAV*
- *Integrated sensing and communication for CAV*