

# Joint Radio-based Sensing and Communication in 5G and Beyond: Prospects, Algorithms and Waveform Optimization

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## Abstract

While the primary purpose of mobile networks is to provide efficient radio connectivity for different types of devices, they also offer an increasingly appealing platform for high-efficiency radio positioning/localization as well as radio based sensing. This is particularly so in the context of the emerging 5G NR and the later 6G networks due to the utilization of very large channel bandwidths and very sophisticated beamforming capabilities, together allowing for accurate time-based and angle-based measurements. In this talk, we address, discuss and demonstrate the prospects and selected challenges of OFDM-waveform based radio sensing in future mobile networks, including e.g. waveform optimization, TX-RX crosstalk, and beamforming optimization aspects.

## Bio



Mikko Valkama received the D.Sc. (Tech.) degree (with honors) from Tampere University of Technology (TUT), Finland, in 2001. In 2003, he was a visiting post-doc research fellow with SDSU, San Diego, CA. Currently, he is a Full Professor and Department Head of Electrical Engineering at the newly formed Tampere University (TAU), Finland. His research interests include radio communications, radio localization, and radio-based sensing, with emphasis on 5G and beyond mobile radio networks.