IEEE Journal of Selected Topics in Signal Processing : Special issue on
Array Signal Processing for Angular Models in Massive MIMO Communications

One of the most promising physical-layer technologies for 5G wireless communications is massive multiple-input multiple-output (MIMO), which scales up conventional MIMO by several orders of magnitude to substantially increase the transmission throughout and network capacity. In recent years, there has been tremendous research progress on communication theory for massive MIMO. An emerging trend in massive MIMO is to take the array processing viewpoint by exploring the angular models of the propagation channels for various aspects of the communication system design. It is expected that array signal processing techniques could provide reliable designs and enhanced performance compared to those directly obtained from the communication viewpoint. Particularly, fundamental concepts in array signal processing (e.g., direction of arrival/departure - DOA/DOD), can be conceptualized and exploited, such as angle-based channel estimation, hybrid beamforming, interference control, spatial division multiple access, etc. Further, angle-based massive MIMO processing entails large data size and high dimensionality, which also invites a data-driven approach to 5G wireless. All above suggest an exciting direction of leveraging advanced array processing techniques to aid wireless communications, leading to a second wave of cross-pollination between array signal processing and wireless communications. The goal of this special issue is to attract researchers in both array processing and wireless communications, to work together at the confluence of these two areas in order to address those challenging problems in massive MIMO communications. The topics of interest include, but are not limited to:

- Wideband DOA estimation in large arrays via off-grid compressive sensing
- Angle information aided channel estimation
- Angle information aided (robust) beamforming design
- Transmission techniques with beam squint effect of large arrays
- Angle reciprocity aided downlink transmission for FDD systems
- Non-orthogonal angle/path division multiple access (ADMA, PDMA) techniques
- The use of angle information in distributed Massive MIMO architectures
- Location-aware technologies with large array
- Angle information aided 3D cellular coverage

- Angle information aided channel estimation with hybrid antenna array
- mmWave transmission and low cost hybrid precoding with angle information
- Low resolution ADC/DAC, phase shifter with angle information
- Solution to blockage in mmWave system with angle information
- Massive array configuration design
- High-mobility transmission with angle tracking approach
- Transmission techniques for large partly calibrated subarrays
- Data driven techniques and deep learning for large array systems

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Dates	Guest Editors
Manuscript submission: February 15, 2019	Feifei Gao (Lead), Tsinghua University, China
First review completed: April 15, 2019	Zhi Tian, George Mason University, USA
Revised manuscript due: May 30, 2019	Erik G. Larsson, Linköping University, Sweden
Second review completed: June 30, 2019	Marius Pesavento, Technical University of
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