Call for Papers
IEEE Journal of Selected Topics in Signal Processing

Special Issue on Signal Processing for Millimeter Wave Wireless Communications

Communication at millimeter wave (mmWave) frequencies is defining a new era of wireless communication. The mmWave band relieves spectral gridlock at lower frequencies by offering much higher bandwidth communication channels than presently used in commercial wireless systems. The next generation of wireless local area networks is exploiting the mmWave unlicensed band at 60 GHz to provide multi-gigabit-per-second data rates. There is also growing interest in using mmWave licensed spectrum for 5G cellular systems. The potential for mmWave is immense.

Signal processing is critical for enabling the next generation of mmWave communication. Because of the wide bandwidth, overall complexity and mixed signal power consumption are significant concerns. This motivates developing MIMO signal processing techniques for example that operate with few high resolution or many low-resolution analog-to-digital converters. The propagation channel characteristics lead to sparsity in the channel, which can be exploited in channel estimation, signal detection, and equalization. System analysis of mmWave wireless systems is more complicated due to the use of compact antennas, sensitivity to blockages, and distance dependent propagation effects. Relays may play an important role in mmWave to provide inband backhaul for cellular networks or to enhance coverage in the presence of blockages. Because of the higher carrier frequencies, supporting mobility becomes a significant challenge requirement the development of time-varying signal processing techniques such as rapid beam adaptation.

This special issue aims to bring together contributions from researchers and practitioners in the area of signal processing for wireless communications with an emphasis on communication at millimeter wave frequencies, including next generation cellular systems, local area networks, personal area networks, ad hoc networks, and vehicular area networks. Original papers are solicited on topics of interest include, but not limited to:

- Beamforming and precoding including analog, hybrid analog-digital, and beamspace
- MIMO receiver algorithms including channel estimation, equalization, and synchronization
- Dealing with low resolution analog-to-digital converters including channel estimation and receiver design
- Exploiting sparsity in the signal or channel
- MIMO communication with large arrays (applied to mmWave)
- Channel models including spatial, temporal, and frequency variations
- System analysis incorporating features like blockage and interference
- Multiple access including OFDMA, SDMA, and other techniques
- Distributed antennas both large scale (infrastructure) and small scale (on a device)
- Heterogeneous mmWave and lower frequency networks
- Fixed relays, mobile relays, and relay transmission techniques
- Feedback issues for millimeter wave including beam search, channel feedback, and adaptive modulation
- New applications of mmWave to ad hoc, device-to-device and vehicular networks
- Joint communication and radar at mmWave frequencies
- Novel analog or digital circuits in support of mmWave signal processing

Prospective authors should visit http://www.signalprocessingsociety.org/publications/periodicals/jstsp/ for information on paper submission. Manuscripts should be submitted using the Manuscript Central system at http://mc.manuscriptcentral.com/jstsp-ieee. Manuscripts will be peer reviewed according to the standard IEEE process.

Manuscript Submission:	~~**May 15, 2015**~~ **June 1, 2015**
First review completed:	August 15, 2015
Revised manuscript due:	October 1, 2015
Second review completed:	December 1, 2015
Final manuscript due:	January 1, 2016
Publication date:	April 2016

Lead guest editor:
Robert W. Heath Jr. The University of Texas at Austin, USA, rheath@utexas.edu

Guest editors:
Nuria González-Prelcic, University of Vigo, Spain, nuria@gts.uvigo.es
Sundeep Rangan, New York University, USA, srangan@nyu.edu
Wonil Roh, Samsung Electronics, South Korea, wonil.roh@samsung.com
Akbar Sayeed, University of Wisconsin-Madison, USA, akbar@engr.wisc.edu