IEEE pimrc

IEEE International Symposium on Personal, Indoor and Mobile Radio Communications
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IEEE ComSoc IEEE Communications Society

Call for Workshop Papers

PIMRC 2018 Workshop W5: Workshop on Small Data Networks

Date: Sunday, September 9. Time: 9.00 – 17.30

Motivation and Background

"Small data" refers to a rising paradigm in modern wireless networks, pointing to information exchanged by smart devices and sensors in the broad context of machine-type communications. Small data sets span typically from metering data and status reports to remote commands and data generated and transmitted within the IoT. They are generally produced by a multitude of devices which access the communication infrastructure sporadically, generating a massive amount of short packets that have to be received with high reliability, exploiting the available spectrum resources efficiently even in absence of coordination. In such a framework, the design of the network protocol departs from conventional approaches used for predictable and persistent data sources. Major changes have to be applied to the physical and the medium access control (MAC) layers to account for the sporadic nature of the transmissions, touching all basic aspects from signal detection, channel estimation, coding and modulation up to the medium sharing policies and possibly involving the higher layers of the communications stack. While traditional protocols treat interference as a waste and therefore are designed to avoid them, in recent years several innovative developments have been proposed, such as physical layer network coding and various techniques based on successive interference cancellation (SIC), where interference is instead embraced and creatively utilized. These developments have opened a completely new perspective for uncoordinated protocols, paving the way to dramatic performance improvements, and rendering the throughput of interference-limited channels competitive with respect to that of systems relying on predictable data sources. This is calling for new studies on the fundamental limits as well as on finding optimal ways of designing waveform, signal-processing algorithms, error correcting schemes and access protocols, and on theoretical tools to drive the system design. Research in the field is further buttressed by clearly defined market-driven goals from the industry, in the quest for highly reliable, highly efficient, low-complexity access solutions for a massive number of devices. The road towards 5G and more generally machine-type communications represent only some relevant application examples where upcoming research has the potential to leave a fundamental mark. The goal of this workshop is to stimulate new contributions to the topic, with emphasis on cross-layer interactions between the MAC and PHY layers of the protocol stack, as well as on the connections to coding and information theory.

Topics of interest include, but are not limited to:

- Fundamental limits on communications for small data sets
- Channel coding and modulation for sporadic transmissions
- Error control coding for ultra-reliable communications
- Network coding in multiple access schemes
- Successive interference cancellation in MAC protocols
- Wireless access protocols for vehicular networks
- Wireless access protocols for machine type communications, large-scale sensor networks, and IoT
- Innovative techniques for 5G and IoT radio access networks
- Efficient access schemes for short-packet communications
- Energy efficient MAC-PHY spatial processing
- Channel estimation and user detection for massive access

Submission Guidelines

Prospective authors are invited to submit technical papers of their previously unpublished work. Accepted workshop papers will be part of the Conference Proceedings and will be uploaded to IEEE Xplore. Papers should be submitted via EDAS; the links are available at http://pimrc2018.ieee-pimrc.org under "Authors". Papers should follow the same Author guidelines of the general symposium, which are available at http://pimrc2018.ieee-pimrc.org/authors/submission-guidelines/.

Key Dates

Paper submission:	**May 18, 2018**
Acceptance notification:	**June 15, 2018**
Final paper due:	**June 29, 2018**

Workshop Organisers

Enrico Paolini – Univerisy of Bologna
Andrea Munari – RWTH Aachen University
Gianluigi Liva – German Aerospace Center (DLR)

Advisory Board

Petar Popovski – Aalborg University
Marco Chiani – University of Bologna
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