Call for Workshop Papers

WCNC 2019 Workshop: Mathematical Tools for IoT Networks (MoTION)

Date: April 15th, 2019
Workshop Organiser(s): Philippe Mary, INSA Rennes, IETR, France; Samir Perlaza, INRIA, Lyon, France; Petar Popovski, Aalborg University, Denmark.

Motivation and Background

IoT, myth or reality, is in an intensive development phase on a technical but also commercial and marketing point of views as well. Many of the existing technical solutions for wireless IoT connectivity are based on the adaptation of the techniques developed for wireless broadband communication and in that sense it is difficult to evaluate how far are they from the optimal solutions. From a theoretical point of view, IoT networks lie on a paradigm shift with respect to usual broadband cellular networks. In general, IoT connections can be divided into two clusters: massive Machine-Type Communication (mMTC) and Ultra-Reliable Low Latency Communications (URLLC). In both types of IoT connectivity the main issue is no longer to achieve the highest possible data rate. In mMTC the objective is to support massive number of moderately reliable connections, while in URLLC the objective is to support several connections with ultra-high reliability and very low latency. In many use cases, IoT connections transport only few data bytes and this is comparable in size to the protocol overhead needed to support that transmission. The main features of IoT networks could be summarized as: i) short packet communications, ii) bursty interference, iii) massive number of nodes and iv) connectionless communications. The first feature points to the techniques of non-asymptotic information theory, which is generalization of the asymptotic results by Shannon. The second feature is due to the small packet sizes, the different sources are random and generate bursty interference which is not Gaussian distributed. The large number of nodes advocates for the use of the stochastic geometry that should be adapted to i) and ii). Finally, in mMTC, due to the high number of nodes, perfect scheduling is not possible and only light coordination mechanisms should be used.

Topics of interest include, but are not limited to:
- Massive multiple access
- Non-asymptotic information theory
- Estimation theory
- Stochastic geometry
- Non-Gaussian interference and rare events dependency modeling
- Low overhead protocols for radio access
- Signal processing and coding techniques for non Gaussian interference.
- High dimensional methods
- Game theory

- Machine learning

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://wcnc2019.ieee-wcnc.org under "Authors". Papers should follow the same Author guidelines of the general symposium, which are available at http://wcnc2019.ieee-wcnc.org/authors/paper-submission-guidelines.

Key Dates

Paper submission:	January 10th 2019
Acceptance notification:	February 15th 2019
Final paper due:	March 1st, 2019

Steering/Technical Committee

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