

IEEE Global Conference on Signal and Information Processing
Call for Papers for
Symposium on Machine Learning for Characterization of Cognitive Communications and Radar

Scope and Motivation:

Over the next 3-5 years demand for radio spectrum is projected to grow dramatically due to explosive growth in communication and sensing applications, while resources in terms of power and bandwidth will remain limited. The widening gap between demand and available resources is emerging as one of the major challenges for all entities sharing the electromagnetic spectrum. Cognitive Radio (CR), with its capability to sense its environment and flexibly adjust its transceiver parameters, has established itself as an enabling methodology for dynamic time-frequency-space resource allocation and management, offering significant improvement of spectral utilization. However, existing cognitive radio models will no longer be adequate, given the massive demands of emerging communications and sensing applications, including capacity, connectivity, high reliability and low latency, so novel models and algorithms are needed to help improve spectrum utilization.

A natural approach to handling these challenges is the development of a broad range of efficient machine learning algorithms, as well as new frameworks for cooperative learning and sharing, based on complex signal patterns in space, frequency and time. Proliferation of software defined radio technology, as well as applications in Self-organized Networks, Machine-to-Machine Communications, Internet of Things etc, will necessarily create even more complex environments in which CR networks of secondary users will compete for spectrum access not only with primary users, but also with other CR networks. Many of these dense multi-user cognitive radio systems would be difficult to capture using conventional machine learning models.

We recognize that characterization of cognitive communication and radar is emerging as a topic area with rich potential, high relevance and broad applicability for machine learning research and development. For instance, DARPA recently announced its Spectrum Collaboration Challenge (SC2) program, which aims at developing novel algorithms and technologies for collaborative and adaptive spectrum sharing both for military and civilian applications. This high profile initiative envisions leveraging recent advances in artificial intelligence, machine learning and cognitive communications, and is expected to spur a significant burst of interdisciplinary research in these areas over the next 3-5 years. The goal of this Symposium is to bring together researchers from the cognitive communications and machine learning communities, to raise awareness of the current trends and developments, to showcase state-of-the-art machine learning approaches to CR network problems, and to provide a forum for sharing ideas and initiating synergistic activities.

Main Topics of interest

We are soliciting original and unpublished papers on topics including, but not limited to:

- Learning in partially observable RF environments
- Multi-agent learning in distributed cognitive radio networks
- Machine learning for cooperative spectrum sensing
- Autonomous learning in unknown RF environments
- Distributed learning techniques for cognitive radio networks
- Characterization of multi-dimensional activity dynamics of CRNs
- Machine learning of the topology and structural properties of CRNs
- Quality of learning with corrupted, censored and missing spectrum sensing samples
- Joint optimization and learning of spectrum usage dynamics and spectrum access control
- Challenges in machine learning for cognitive radars
- Privacy-preserving machine learning for cognitive radio
- Privacy-preserving machine learning for cognitive radar
- Machine learning for cognitive technologies in 5G cellular networks
- Cloud-based machine learning for cognitive communications and radar
- Non-parametric machine learning for cognitive radio and radar
- Generative Models for machine learning in cognitive communications and radar
- Machine learning for geolocation in cognitive communications and radar
- Adaptive information-centric cognitive networks
- Network estimation for cognitive networks
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Paper Submission:

Submit papers, at most 6 pages long in two-column IEEE format, through the GlobalSIP website at <http://www.ieeeglobalsip.org/Papers.asp>.

Important Dates:

Paper Submission Deadline: June 5, 2016

Final Acceptance Announced: August 5, 2016

Camera-ready Papers Due: September 5, 2016

Symposium Organizers:

- Dr. Silviya Kokalj-Filipovic, Naval Research Laboratory, Washington DC
- Dr. George Stantchev, Naval Research Laboratory, Washington DC

Symposium Technical Chair:

- Prof. H. Vincent Poor, Princeton University