

# Annals of Telecommunications



**Call for papers  
Special Issue on**

## **Machine Learning for Signal Processing and Communication**

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Research in the Communication and Signal Processing area focuses on issues regarding the efficient processing and transmission of multimedia data. Some examples of sources of data include sound, images, and a large variety of sensor output signals. Much of modern statistical and adaptive signal processing relies on learning algorithms of one form or another. However, enormous amounts of audio, video and text data are widely generated and stored by modern connected devices. Hence, there is a need for efficient ML algorithms in terms of accuracy and speed and this becomes of crucial importance for efficient information processing. At a practical level, machine learning and signal processing are frequently combined. The most common classical relationship is signal processing as a pre-processing step before elaborated machine learning. However, the emergence of deep learning has challenged this traditional sequential relationship, as hierarchical representations are now frequently directly learned from raw input signals. Modern methods tightly integrate machine learning and signal processing into unified models, to reach signal understanding. This significant combination has the potential to alleviate several digital signal processing and communication challenges: ranging from computational efficiency, fast online adaptation and learning with limited supervision, data sparsity to the ability of the corresponding algorithms to combine heterogeneous information, to incorporate prior knowledge about the problem, or to efficiently and friendly interact with the user. Semi- and weakly-supervised learning methods have proved to significantly improve the performance when only a small amount of annotated data is available and lately self-supervision has led to breakthroughs in learning from large non-annotated corpuses. Correlation analysis, transfer learning, and multi-task learning have demonstrated their potential in integrating severely heterogeneous data. Sparse representations and clustering approaches have been exploited in de-noising and selecting exemplary samples and prototypes from the raw data.

This special issue aims to demonstrate the contribution of machine learning techniques to the research and development of advance signal processing and communication. The special issue seeks high-quality, original technical papers from academia, government, and industry. Topics of interest include, but are not limited to:

- Deep Learning, neural networks and representation learning for signal processing
- Neural hardware systems for signal processing and communication
- Multimodal Learning algorithms for signal processing and communication
- Incremental learning for signal processing and communication
- Structure learning for signal processing and communication
- Machine learning algorithms for audio, video and image processing
- Data-driven optimization of wireless mobile communication and signal processing
- Cognitive systems for signal processing, transformation, understanding and communication
- Mathematical foundations of machine learning for signal processing and communication
- Information theoretic approaches for machine learning and signal processing
- Machine learning algorithms for signal detection and synchronization
- Distributed, decentralized, and cooperative signal processing using machine learning algorithms
- Machine learning for 5G system and PHY/MAC optimization (massive MIMO, mmWave,...)
- Pattern recognition and classification methods for signal processing and communication

- Machine learning based signal processing for software defined and cognitive radio
- Machine learning based signal processing for green communications, communications powered by energy harvesters and wireless power transmissions
- Machine learning based signal processing for optical, smart grid and powerline communications
- Machine learning algorithms for spread-spectrum localization, positioning and tracking techniques
- Machine learning based spatial and distributed transmission techniques
- Cloud-based and fog-based communications with machine learning schemes for signal processing
- Machine Learning and signal processing for differential privacy
- Machine Learning algorithms for Biometric identification
- Machine learning and signal processing for cognitive information processing
- Machine learning and signal processing of large scale datasets

### Guest Editors

Prof. Naveen Chilamkurti, La Trobe University, Melbourne, Australia

Prof. Robert Hsu, Chung Cheng University, Minxiong, Chiayi, Taiwan

Prof. Claude D'Amours, Ottawa University, Canada

Prof. Christian Wolf, Insa Lyon, France

Papers must describe original research that advances state-of-the-art in the above area and must not be simultaneously submitted to a journal or a conference with proceedings. Papers must be written in excellent English and should not exceed 10 pages. Previously published or accepted conference papers must contain at least 40% new material to be considered for the special issue. A covering letter to the Guest editors clearly describing the extensions made must accompany these types of submissions. All submissions must be made using the instructions available at:

<http://annalsoftelecommunications.wp.mines-telecom.fr/how-to-publish/>

The authors can directly submit their papers at: <https://www.editorialmanager.com/ante/> and must select the menu "Choose Article Type" and then the item "CfP: Machine Learning for Signal Processing and Communication".

### Deadlines

- **Manuscript submission** June 2019
- **Notification** August 2019
- **Online with DOI** As soon as accepted
- **Printed issue** Early 2020



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