

Call for Papers
IEEE Signal Processing Society
IEEE SIGNAL PROCESSING MAGAZINE

Special Issue on “Distributed, Streaming Machine Learning”

The field of machine learning has undergone radical transformations during the last decade. These transformations, which have been fueled by our ability to collect and generate tremendous volumes of training data and leverage massive amounts of low-cost computing power, have led to an explosion in research activity in the field by both industrial and academic researchers. Unlike many other disciplines, advances in machine learning research are also finding rapid adoption by industry and disrupting fields ranging from healthcare, journalism, and retail industry to wireless communications, supply chain management, and automotive industry. In many of the up and coming applications of machine learning in these fields, such as connected and/or autonomous vehicles, smart grids, edge-caching wireless networks, cloud computing, and urban policing, data are increasingly distributed *and* streaming. Training predictive models in this distributed, streaming setting requires a rethinking of off-the-shelf machine learning solutions. A number of academic and industrial researchers have recognized the need for this in the last few years; the resulting solutions leverage algorithmic and analytical tools from a number of research areas that cut across different disciplines. Many of these tools, such as stochastic approximation, online learning, distributed optimization, and decentralized computing, have been the mainstay of signal processing researchers for more than a few decades. The IEEE Signal Processing Magazine, therefore, is one of the best forums to archive the latest advances in machine learning from data that are either distributed or are both distributed and streaming, and to discuss many of the open challenges that remain to be solved for broad adoption of machine learning tools across a large number of industries that are expected to routinely deal with large volumes of distributed and streaming datasets.

This special issue seeks to provide broad coverage of recent advances in machine learning and artificial intelligence that deal with datasets that either are distributed or are both distributed and streaming. Submissions of comprehensive overviews of methodological advances as well as more application-oriented contributions are encouraged.

Topics of interest include (but are not limited to):

- Supervised, unsupervised, and semi-supervised machine learning from distributed datasets
- Federated learning and related paradigms for machine learning and artificial intelligence
- Distributed learning and federated learning from streaming data
- Distributed reinforcement learning, especially for the case of multiagent systems
- Coding theoretic techniques for robustness in distributed machine learning
- Distributed learning and federated learning in the presence of adversaries
- Distributed convex and nonconvex optimization techniques for machine learning and artificial intelligence
- Novel applications of machine learning and artificial intelligence involving distributed and streaming data

Submission Process

The Special Issue seeks to offer broad coverage of machine learning and artificial intelligence from datasets that are either distributed or are both distributed and streaming, with emphasis on most recent developments in theory, algorithms, and applications. Submissions of comprehensive overviews of methodological advances are strongly encouraged, as well as papers dealing with new and emerging applications. All submissions will be peer reviewed according to the IEEE and Signal Processing Society guidelines. Submitted articles should not have been published or be under review elsewhere. White papers and full manuscripts should be submitted using the Manuscript Central interface at <https://mc.manuscriptcentral.com/sps-ieee>; see <https://signalprocessingsociety.org/publications-resources/ieee-signal-processing-magazine/information-authors-spm> for detailed submission guidelines and information.

Important Dates

White papers (5 pages max.) due: **April 8, 2019**

Invitation notification: **May 1, 2019**

Manuscripts due: **July 1, 2019**

Decision notification: **September 1, 2019**

Revised manuscripts due: **November 1, 2019**

Final acceptance notification: **January 1, 2020**

Final manuscripts due: **February 1, 2020**

Publication due: **May 1, 2020**

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