

# Top Downloads in IEEE Xplore

Each "Reader's Choice" column focuses on a different publication of the IEEE Signal Processing Society. This month we are highlighting articles in *IEEE Transactions on Signal and Information Processing over Networks (T-SIPN)*.

*T-SIPN* publishes high-quality papers that extend the classical notions of processing of signals defined over vector spaces (e.g., time and space) to processing of signals and information (data) defined over networks, potentially dynamically varying. In signal processing over networks, the topology of the network may define structural relationships in the data or may constrain processing of the data. Topics include distributed algorithms for filtering, detection, estimation, adaptation and learning, model selection, data fusion, and diffusion or evolution of information over such networks and applications of distributed signal processing.

This issue's "Reader's Choice" column lists the top 10 articles of *T-SIPN* most downloaded from January 2017 to August 2018. Your suggestions and comments are welcome and should be sent to Associate Editor H. Vicky Zhao (vzhao@tsinghua.edu.cn).

**Joint Optimization of Radio and Computational Resources for Multicell Mobile-Edge Computing**  
 Sardellitti, S.; Scutari, G.; Barbarossa, S.  
 Migration of computationally expensive

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tasks from mobile devices to a common cloud server in a multiple-input, multi-output multicell system is considered in this paper, and the problem is formulated as the joint optimization of the radio resources and the computational resources with latency constraints. The authors propose an iterative algorithm that converges to a local optimal solution, and its implementation is distributed and parallel, requiring only limited coordination with the cloud.

2015

**Graph Signal Denoising via Trilateral Filter on Graph Spectral Domain**

Onuki, M.; Ono, S.; Yamagishi, M.; Tanaka, Y.

This paper presents the graph spectral domain representation of the data-dependent trilateral filter and designs an effective graph signal denoising filter with a Tikhonov regularization. The authors also

propose a regularization parameter optimization technique that approximately minimizes the mean squared error with respect to the unknown graph signal of interest.

2016

**Distributed Localization and Tracking of Mobile Networks Including Noncooperative Objects**

Meyer, F.; Hlinka, O.; Wymeersch, H.; Riegler, E.; Hlawatsch, F.

A Bayesian method for distributed localization and tracking of cooperative agents and noncooperative objects in wireless networks is proposed. This method provides a consistent combination of cooperative self-localization (CS) and distributed tracking (DT). Particle-based belief propagation is combined with a consensus or gossip scheme. High localization accuracy is achieved through a probabilistic information transfer between the CS and DT stages.

2016

## Distributed Attack Detection and Secure Estimation of Networked Cyberphysical Systems Against False Data Injection Attacks and Jamming Attacks

Guan, Y.; Ge, X.

A distributed attack detection and secure estimation for a cyberphysical system monitored by a wireless sensor network is studied, where the system is subject to both a false data injection attack at the physical system layer and jamming attacks at the cyberlayer. Resilient attack detection estimators are proposed to provide reliable state estimations and to detect the false data injection attack.

2018

## Joint Uplink/Downlink Optimization for Backhaul-Limited Mobile Cloud Computing With User Scheduling

Al-Shuwaili, A.; Simeone, O.; Bagheri, A.; Scutari, G.

This paper investigates the joint optimization of computing and communication resources in a mobile cloud computing system to minimize the mobile energy consumption under latency constraints. The proposed design accounts for multi-antenna uplink/downlink transmissions, with or without cooperation on the downlink, and the allocation of backhaul and computational resources and user selection. Successive convex approximation techniques are used to compute stationary solutions.

2017

## Spectral Graph Wavelets and Filter Banks With Low Approximation Error

Sakiyama, A.; Watanabe, K.; Tanaka, Y.

The work in this paper proposes wavelets and filter banks on the graph spectral domain that are defined as a sum of sinusoidal waves and can be easily approximated by low-order polynomials. The upper bound of the error after the Chebyshev polynomial approximation can be rigorously calculated, and the parameters of the filter banks can be efficiently obtained from any real-value linear phase finite impulse response filter banks in regular signal processing.

2016



HTTPS://PXABAY.COM/EN/ARTIFICIAL-INTELLIGENCE-BRAIN-THINK-3382507/

## Asynchronous Optimization Over Heterogeneous Networks via Consensus ADMM

Kumar, S.; Jain, R.; Rajawat, K.

The nonconvex general-form consensus optimization problem in a multi-agent networked system is considered. An asynchronous and distributed alternating direction method of the multipliers framework is proposed, which allows nodes to defer or skip the computation and transmission of updates. The proposed algorithms are shown to converge to a local minimum under certain regularity conditions.

2017

## Two-Tier Device-Based Authentication Protocol Against PUEA Attacks for IoT Applications

Lin, S.-C.; Wen, C.-Y.; Sethares, W.A.

After considering the primary user emulation attack against the Internet of Things applications, this paper proposes a two-tier device-based authentication protocol. The proposed method selects sensing sensors and develops a detection and notification mechanism, considering information exchange and handshaking protocol between sensors and nodes. The proposed work also relies on physical properties of the devices, such as the internal component delay and the difference between different clocks, to identify malicious nodes.

2018

## Network Topology Inference from Spectral Templates

Segarra, S.; Marques, A.G.; Mateos, G.; Ribeiro, A.

The problem of identifying the structure of an undirected graph from observable indirect relationships generated by a diffusion process is addressed in this paper. The proposed method searches for the network that endows the resulting graph-signal transforms with prescribed spectral properties, while the inferred graph also exhibits desirable structural characteristics. Efficient inference algorithms using provably tight convex relaxations are developed to identify the sparsest graph shift operator consistent with the given eigenspace.

2017

## Distributed Privacy-Preserving Collaborative Intrusion Detection Systems for VANETs

Zhang, T.; Zhu, Q.

Proposed in this work is a privacy-preserving machine-learning-based collaborative intrusion detection system for vehicular ad hoc networks. The proposed algorithm employs the alternating direction method of multipliers to a class of empirical risk minimization problems and trains a classifier to detect intrusions. The dual-variable perturbation method is proposed to provide dynamic differential privacy.

2018

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