

# IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS

## Call for Papers Complex Networks for Modern Smart Grid Applications

### Guest Editors

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### Scope and Purpose

The IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS) seeks original contributions for an issue on “Complex Networks for Modern Smart Grid Applications”, scheduled to appear in June 2017.

Driven by a number of emerging needs, power grids are anticipated to be complex and smart networked platforms. Analyzing the large amount of collected data from monitoring systems and developing real-time remedial control actions to avoid system-wide cascading blackouts are the main goals for modern smart grids. The objective of this special issue is to identify, address, and disseminate state-of-the-art research in theory of complex systems with applications to smart grids.

The motivation behind this proposal is twofold; (i) we want to make the work in this area known to power systems practitioners as highly implementable, by publishing papers that address real applications in Modern Smart Grids, as opposed to purely theoretical concepts, and (ii) we want to expand the study of more complex power grids and other distributed power generation systems using developed complex network theory.

This special issue does not deal with complex networks alone or power grids separately, but instead provides the unique venue for a crossover of complex network applications and power system developments. Complex network applications have been, in recent years, a key emerging topic. Smart grid, on the other hand, is an important emerging infrastructure, the development of which encompasses many foundational aspects in circuits and systems. There is a strong demand to analyze and optimize large-scale power grids (and not just toy problems) under various types of constraints together with the emerging science of large-scale complex networks. The scope of this special issue thus uniquely hinges upon the intriguing and innovative applications of complex network concepts and principles to study power systems aiming to advance the structural design, system evaluation, practical implementation, control performance and robustness, among many key technical aspects, that are not readily dealt by using conventional tools.

We seek original papers with novel research contributions in all aspects of complex and large-scale systems of relevance and significance to the analysis and design of smart grids, with potential to make impactful contributions to the emerging development of this cross-disciplinary study.

### Topics of interest

Topics of interest for this issue include, but are not limited to:

1. Theory, methods and tools, practical applications of complex system theory to smart grid.
2. Test bed for providing realistic complex power grids systems for evaluating theory, methods and tools, and for performing experiments.
3. Modeling and analysis of complex power grid.
4. Power system operation, control and optimization.
5. Cyber security and big data issues of smart grid.
6. Circuits and systems for communications in smart grid.
7. Complex network theory based power grid vulnerability assessment.
8. Applications of complex systems to design advanced architectures for the generation, transmission and distribution of power.
9. Development of detection and identification methods for both power system components and devices with operational malfunctions and anomalies.
10. Development of robust control and corrective control methods to deal with degraded components and devices and to deal with renewable energy with high-level of variability.

**Important dates**

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|---------------------------------------|------------------|
| 1. Manuscript submissions due:        | 1st of Oct 2016  |
| 2. First round of reviews completed:  | 1st of Dec 2016  |
| 3. Revised manuscripts due:           | 15th of Jan 2017 |
| 4. Second round of reviews completed: | 15th of Feb 2017 |
| 5. Final manuscripts due:             | 15th of Apr 2017 |

**Authors' guideline**

Only manuscripts, 8 to 14 pages in length without authors' biography and formatted according to the single-space, double-columns IEEE journal paper style, should be submitted to JETCAS. For complete authors' guideline, please visit <http://jetcas.polito.it/general.html>.

**Request for information**

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