Optimization, Control, and Machine Learning for Interdependent Networks

A Springer Nature Operations Research Forum Topical Collection

Guest Editors:

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Call for Papers

The ever-increasing growth of smart technologies opens up the necessity to think about the structure of networks from independent to interdependent fashion. While the traditional independent networks are studied in individualistic way, the notion of interdependence among multi-layered networks collaborates in an interactive or collective manner. The cutting-edge technologies particularly in different engineering disciplines demands for establishing cyber and physical linkages among various networks, such as energy networks, transportation networks, water networks, and financial networks, which can collapse the blockade nature of traditional independent networks in order to create more flexibility in fulfilling demand through the complementary behavior of heterogeneous resources. Such coupling of multi-layered networks paves the way for optimal resource exchange, distributed decision making, and knowledge discovery through applying machine learning and optimization techniques. But, coupling such various independent networks may arise technical and political issues that need to be addressed, including multi-layer coupling architecture, network interdependence evaluation and analysis, efficient and secure resource exchange, multilateral resource market design, policy and access control issues, efficacious data analytics, and globally optimum decision making, which call for interdisciplinary research on novel optimization and machine learning models and methods.
To exploit synergies across network infrastructures, this special issue aims to create an opportunity for researchers from various fields, including but not limited to network science, data science, operation research, computer science, and system engineering, to share their original research works focusing on the interdependent networks related issues. We strongly believe that this channel will benefit both academic and industrial communities. The editorial committee solicits original research papers and review articles that target the themes using advanced machine learning methods and optimization techniques.

Potential topics include but are not limited to the following for interdependent networks:

- Graph-theoretic models for networks-of-networks
- Distributed/decentralized decision-making strategies for interdependent networks
- Secure and reliable resource-sharing schemes
- Efficient resource-sharing in interdependent networks
- Efficient data analytics of interdependent networks
- Multimodal behavior analysis of interdependent network agents
- Optimization algorithms for interdependent networks, e.g., coupled energy and transportation networks, coupled healthcare and transportation systems, coupled energy and financial systems
- Dynamics of interdependent networks
- Equilibrium model of multilateral trading in the integrated resource markets.

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<th>Submission Deadline</th>
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<td>Publication Date</td>
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Papers are published upon acceptance, regardless of the Special Issue publication date.

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Submission Procedure:

Papers should be submitted at the *SN Operations Research Forum* website: https://www.editorialmanager.com/orfo/default.aspx

Select Article Type: Manuscript

Upload your files: When the system asks, "Does this manuscript belong to a special issue?" reply: Yes, then choose the option “Optimization, Control, and Machine Learning for Interdependent Networks.”

Complete the submission process as required.