

Call for Papers: Special Issue on the IEEE Transactions on Control Systems Technology

Resilient Control of Cyber Physical Power and Energy Systems

Our power and energy systems are becoming more integrated and interconnected. The increasing integration of edge devices and dependence on cyber infrastructure provides both the potential for benefits and risks. The integration is enabling more dynamic and flexible control paradigms while at the same time increasing the cyber-attack surface and uncertainty of behavior. Control methodology in this new world must be designed for resilience and must have the ability to withstand, react, and respond to both physical faults and cyber-induced threats. Understanding system resilience under adverse conditions requires studying control performance and how cyber infrastructure can integrate with and support the overall resilience of control applications.

This special issue aims to capture the state of the art in device-and system-level control methods for assured power and energy system resilience and cutting-edge methods to measure, predict and validate CPS resilience performance. Application areas of interest include (but are not limited to) the smart grid, power generation and transmission systems, microgrids, energy storage, distributed energy resources and other grid edge technologies. Topics relevant to this special issue include (but are not limited to):

- Modeling of processes under adverse conditions for resilient control
- Resilience performance metrics and their applications to control problems
- Distributed control methods that guarantee system-wide resilience
- Data-driven resilient estimation and control methods deployable at the device- or system-level
- Adaptive (resilient) estimation, control, and coordination methods with situational awareness
- Robust control of networked systems promoting resilience while accounting for inherent uncertainties
- Experimental methodology to assess/validate control system resilience
- Uncertainty quantification around ‘black swan’/extreme low occurrent events
- Benchmark datasets and resilient control test case scenarios
- Experimental evaluation of system resilience

Submission Details:

All papers submitted to the special issue will be subjected to peer review in accordance with the established practices of the IEEE Transactions on Control Systems Technology. Only Regular Papers may be submitted to, and will be considered for, the special issue. Manuscripts submitted to TCST for inclusion in the special issue will be handled by a panel of Guest Editors, and screened for compliance with the scope of the special issue, as detailed in the Call for Papers. Manuscripts that are deemed unsuitable for the special issue will be returned to the authors and may not be resubmitted or considered for publication outside the special issue without approval from the Editor-in-Chief.

Authors are invited to submit their manuscripts through the Transactions submission portal <https://css.paperplaza.net/journals/tcst/scripts/login.pl> (once you login, click on “Submit a new paper to IEEE TCST” and select the type of submission corresponding to the special issue). The manuscript format should follow the guidelines defined by the journal: <http://css.paperplaza.net/journals/tcst/>. Hardcopy submissions will not be accepted.

Important Dates:

- Submission site opens on: 01 October 2022
- First Submission Deadline: 30 March 2023
- Notification of First Round Decision: 30 June 2023
- Revised Paper Submission Deadline: 31 August 2023
- Notification of Final Decision: 30 September 2023
- Final Paper Submission Deadline: 31 October 2023
- Tentative Publication Date (Online): January 2024

Guest Editors:

Veronica Adetola (Corresponding Guest Editor)

Pacific Northwest National Laboratory

United States

Tel: +1 (509) 371-6996

E-mail: veronica.adetola@pnnl.gov

Thomas Edgar

Pacific Northwest National Laboratory

United States

E-mail: thomas.edgar@pnnl.gov

Masoud Abbaszadeh

GE Global Research

United States

E-mail: masoud@ualberta.net

Craig Rieger

Idaho National Laboratory

United States

Email: craig.rieger@inl.gov

Quanyan Zhu

New York University

United States

E-mail: quanyan.zhu@nyu.edu

Roy Sandip

Washington State University, Pullman

United States

Email: sandip@wsu.edu

Sai Pushpak Nandanoori

Pacific Northwest National Laboratory

United States

E-mail: saipushpak.n@pnnl.gov

