



## PSERC WEBINAR

# Convergence of AI, Physics, Computing, and Control for Intelligent Power System Control

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With increased uncertainties and rapidly changing operational conditions in power systems, existing stability control methods and operation paradigms have outstanding issues in terms of either speed, adaptiveness, or scalability. Recent years have seen notable progress in AI and learning-based control methods such as deep reinforcement learning (DRL) for solving challenging control and decision-making problems across many domains such as games, robotics and power systems. However, existing methods still have scalability, adaptability, and security issues. To address these challenges, an integrated framework based on the idea of Convergence of AI, Physics, Computing, and Control is developed. Based on this framework, scalable, physics-informed DRL algorithms and high-performance computational tools are developed to achieve efficient training of DRL agents for intelligent stability control for large-scale power systems. The developed methods have been tested and demonstrated with large-scale power systems. Finally, this presentation will discuss the potential of this framework, when combined with new hardware and software platform, for transforming the grid operation and control from the control rooms to the grid edge.

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[LINK TO WEBINAR](#)

**1:00-2:00 P.M. EDT**

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**Dr. Qihua Huang** is an Associate Professor in the Electrical Engineering Department of Colorado School of Mines. Prior to this, he was a Principal Power System Engineer at Utilidata Inc and a Staff Power System Research Engineer at Pacific Northwest National Laboratory. He received his Ph.D. degree in electrical engineering from Arizona State University, Tempe, AZ, USA, in 2016, B.Eng. and M.Eng. degrees in electrical engineering from South China University of Technology, Guangzhou, China, in 2009 and 2012, respectively. He is the recipient of the 2019 IEEE Power and Energy Society (PES) Prize Paper Award, 2018 R&D 100 Award and best conference paper awards in IEEE PES General Meeting in 2020 and 2018. He serves as an Associate Editor of IEEE Transactions on Power Systems. His research interests include power system modeling, simulation and control, fusion and application of AI/machine learning and advanced computing technologies for digitizing and transforming power and energy systems.

