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### Lecture by

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### Cooperative control in DC microgrid: Voltage regulation and current sharing

#### 直流微网多源协同供电控制

DC microgrid is a power system that consists of distributed generators, energy storage facilities, energy conversion devices, and power loads. By integrating various power sources, DC microgrid is essential in promoting sustainable energy development and thus it becomes an important part of smart grid construction. In a DC microgrid, it is critical to coordinate multiple power sources to ensure a stable power supply for the loads. This typically involves two control objectives: maintaining a stable bus voltage and achieving reasonable current sharing among the sources. This talk will focus on the cooperative power supply control of multiple sources from three aspects: how to improve the convergence rate and the dynamic performance; how to reduce the communication burden during the control process; how to ensure the performance against potential attacks. We will also discuss the possible research topics in the future.



#### About the author

**Yan-Wu Wang** received the B.S. degree in automatic control, the M.S. degree and the Ph.D. degree in control theory and control engineering from Huazhong University of Science and Technology (HUST), Wuhan, China, in 1997, 2000, and 2003, respectively. She has been a Professor with the School of Artificial Intelligence and Automation, HUST, since 2009. Her research interests include hybrid systems, cooperative control, and multi-agent systems with applications in smart grid. Currently she serves in the editor boards of several journals, including IEEE Transactions on Smart Grid, International Journal of Robust and Nonlinear Control, Journal of the Franklin Institute, and Neurocomputing. Dr. Wang was a recipient of several awards, including the first prize of Natural Science Award of Hubei Province in 2014, the first prize of Natural Science Award of the Ministry of Education of China in 2005, and the Excellent PhD Dissertation of Hubei Province in 2004, China. In 2008, she was awarded the title of "New Century Excellent Talents" by the Ministry of Education of China.