



學術報告

Distributed Real-Time Voltage Regulation in Distribution Networks



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时间: 1月8日 星期一 上午 8:30

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Biography: Xinyang Zhou received a B.S. in Engineering from Zhejiang University, China in 2012. He is currently a PhD candidate in Telecommunications at the University of Colorado at Boulder. His research mainly aims to design distributed optimization and control algorithms for future power networks with large number of distributed energy resources; in particular, distributed real-time frequency and voltage controls that achieve system-wide optimality and robustness. Another research focus is to design efficient algorithms for resource allocation in networked systems, including sustainable wireless system and task collaboration among multiple mobile devices. My research employs techniques and tools from optimization, control theory, and game theory.

The increasing penetration of renewable and distributed energy resources in distribution networks calls for fast and efficient distributed voltage regulation algorithms. We first study the existing local Volt/VAR control and design new local algorithms with less restrictive convergence conditions and better voltage regulation through reverse and forward engineering. We then investigate the incentive issue and introduce a market-based voltage regulation framework, and extend it to the real-time setting with time-varying network condition. The resulting randomized distributed algorithm admits asynchronous implementation in practical systems, and its performance is analytically characterized as well as numerically evaluated.