

Title: Connecting Automatic Generation Control and Economic Dispatch from an Optimization View

Abstract: Automatic generation control (AGC) regulates mechanical power generation in response to load changes through local measurements. Its main objective is to maintain system frequency and keep energy balanced within each control area so as to maintain the scheduled net interchanges between control areas. The scheduled interchanges as well as some other factors of AGC are determined at a slower time scale by considering a centralized economic dispatch (ED) problem among different generators. However, how to make AGC more economically efficient is less studied. In this paper, we study the connections between AGC and ED by reverse engineering AGC from an optimization view, and then we propose a distributed approach to slightly modify the conventional AGC to improve its economic efficiency by incorporating ED into the AGC automatically and dynamically.

Bio: Na Li received the B.S. degree in mathematics from ZheJiang University, China, in 2007, and the Ph.D. degree in control and dynamical systems from California Institute of Technology, Pasadena, CA, USA, in 2013. She is currently a Postdoctoral Associate of the Laboratory for Information and Decision Systems at Massachusetts Institute of Technology, Cambridge, MA. Her research is on power and energy networks, optimization, game theory, decentralized control and dynamical systems. She entered the Best Student Paper Award finalist in the 2011 IEEE Conference on Decision and Control.