An Integrated Design Approach to Power System

Abstract: Power system is at the brink of transformation. Engineering needs, economic forces and environmental factors are the main drivers of this transformation. The vision is to build a smart electrical grid and a smarter market mechanism around it to fulfill mandates on clean energy. Looking at engineering and economic issues in isolation is no longer an option today; it needs an integrated design approach. This talk will give some examples of research projects that addresses this evolving area of research. In particular, it would focus on optimizations over power networks and Cournot equilibrium in electricity markets. The goal is to demonstrate that modern optimization, controls, game theory and microeconomics together can provide unique insights into this complex system and the ideas often generalize to other application domains.

Host: Dr. Arye Nehorai

Short Bio: Mr. Subhonmesh Bose is a Ph.D. candidate in the Department of Electrical Engineering at the California Institute of Technology since Fall ’09. Prior to that I was an undergraduate student at IIT Kanpur, India. My interests are in rigorous system design of various aspects in the evolving smart grid, especially in the intersection of engineering and economics harnessing mathematical tools and techniques from operations research, game theory, optimization and control. I have also worked for Southern California Edison for two years on various research projects in partnership with Caltech. I have been jointly advised by Prof. S. Low, Prof. K. M. Chandy, Prof. A. Wierman and Prof. B. Hassibi.