

Industrial and Systems Engineering Seminar

Appointment Scheduling Under Patient Preference and No-Show Behavior

Wednesday, May 1

3:15 PM – Refreshments before the Seminar

3:30 PM – Graduate Seminar

Mechanical Engineering Room 4125 A & B



Professor Nan Liu

Assistant Professor

Department of Health Policy and Management

Columbia University

Motivated by the rising popularity of electronic appointment booking systems, we develop appointment scheduling models that take into account the patient preferences regarding the time of service. The provider dynamically decides which appointment days (or more generally, clinic sessions) to make available for the patients, who then choose one of the days offered or leave without an appointment. Patients may cancel or not show up for their scheduled service. The provider's objective is to maximize the expected daily net "profit", i.e., the "revenues" of serving patients less the "cost" of maintaining the service. We first develop a static model, characterize its optimal policy and bound its optimality gap. Building on this model, we develop a dynamic model that considers the current system state. We test our models under the patient preferences estimated via a discrete-choice experiment we conducted in a large health center. We find that our proposed models, especially the dynamic one, significantly outperform other benchmarks. This is joint work with Jacob Feldman, Huseyin Topaloglu (Cornell) and Serhan Ziya (UNC-Chapel Hill).

Nan Liu is an Assistant Professor in the Department of Health Policy and Management at Columbia University. His research focuses on developing and applying operations management tools and stochastic models to improve the efficiency and effectiveness of health and services systems. In the health policy arena, he has particular interest in the organization, deliver and financing of primary care.