Industrial and Systems Engineering Seminar

Fitting Queueing Models to Service System Data: What Arrival Process Model is Appropriate

Wednesday, September 16

3:15 PM – Refreshments before the Seminar

3:30 PM – Graduate Seminar

Mechanical Engineering Room 4125 A & B

Professor Ward Whitt

Professor

Department of Industrial Engineering and Operations Research

Columbia University

In call centers, hospital emergency departments and most other service systems, the arrival rate varies strongly over each day. Thus, a natural arrival process model for a queueing model to be used in performance analysis is the nonhomogeneous Poisson process (NHPP), but this should be supported by analyzing system arrival data. We discuss how the conditional-uniform property of the homogeneous Poisson process (HPP) can be applied to generate a statistical test of the NHPP. We discuss additional measures that need to be taken in order to detect important deviations from the NHPP model.

(Primarily based on the paper by Song-Hee Kim and Ward Whitt, "Are Call Center and Hospital Arrivals Well Modeled by Nonhomogeneous Poisson Processes?" *Manufacturing and Service Operations Management*, Vol. 16, 2014, pp.464-480.)

BIO: Ward has been active in applied probability within INFORMS and conducted research on queueing models for nearly 50 years. He is known for performance analysis tools, such as *Queueing Network Analyzer* (QNA), and supporting heavy-traffic limit theorems, as discuss in his 2002 book, *Stochastic-Process Limits*. After receiving a PhD in operations research from Cornell in 1969, Ward taught at Stanford and Yale before joining Bell Labs in 1977, where he remained for 25 years before joining the faculty at Columbia in 2002.