University of Southern California

DANIEL J. EPSTEIN DEPARTMENT OF
INDUSTRIAL AND SYSTEMS ENGINEERING

EPSTEIN INSTITUTE SEMINAR • ISE 651 SEMINAR

Optimization of On-line Appointment Scheduling

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ABSTRACT

Many service systems provide appointments to customers in advance of their arrival. However, because service times are uncertain, the amount of time to allot to customers, and the amount of daily capacity to allocate for services are challenging decisions. In many service systems, appointment scheduling is further complicated by the fact that the exact number of customers to be scheduled is not known in advance. Instead, customers request appointments sequentially over time, and appointments are quoted on-line. Therefore it is necessary to make these on-line scheduling decisions in such a way that schedules are adaptable to variation in customer demand over time. In health care delivery systems, achieving this balance is particularly important because of the high cost of resources, including human and physical resources. In this context, uncertainty in demand arises due to the inherently uncertain nature of urgent care and the potential for patient no-shows. In this presentation we describe how stochastic programming models can be used for dynamic sequencing and scheduling of appointments. We describe several types of appointment scheduling problems and relevant models. In each case we discuss properties of the optimal solutions and ways to exploit model structure to improve the computational efficiency of decomposition-based solution methods. Numerical experiments based on empirical data from outpatient procedure centers are used to draw insights into optimal sequencing and scheduling decisions, as well as the performance of the solution methods. Finally, this talk will conclude with a discussion of future research directions related to planning and scheduling of health service systems.

TUESDAY, APRIL 23, 2013
VON KLEINSMID CENTER (VKC) ROOM 100
3:45 – 5:00 PM

SPEAKER BIO

Dr. Brian Denton is an Associate Professor in the Department of Industrial and Operations Engineering at University of Michigan. Previously he has been a Professor at North Carolina State University in the Department of Industrial and Systems Engineering, a Senior Associate Consultant at the Mayo Clinic in the College of Medicine, and a Senior Engineer at IBM. He is currently a Fellow at the Cecil Sheps Center for Health Services Research at the University of North Carolina, Chapel Hill. His primary research interests are in optimization under uncertainty as it relates to applications in health care delivery and medical decision making. He has won the Institute for Operations Research and Management Science (INFORMS) Service Section Best Paper Award (2010), the National Science Foundation (NSF) Career Award (2008), the INFORMS Daniel H. Wagner Prize (2005), the Institute of Industrial Engineers (IIE) Outstanding Publication Award (2005), and the Canadian Operations Research Society (CORS) Best Paper Award (2000). He is a Past President of the INFORMS Health Applications Section (2009) and he is currently serving as Secretary of INFORMS (2012-2013). He has co-authored more than thirty scientific articles and holds over twenty patents with the U.S. Patent and Trademark Office. He completed his doctorate in Management Science at McMaster University, his M.Sc. in Physics at York University, and his B.Sc. in Chemistry and Physics at McMaster University in, Ontario, Canada.