

NYU Stern School of Business
Department of Information, Operations & Management Sciences
IOMS Research Seminar Series

TOPIC: Algorithmic challenges for greening data centers

SPEAKER: Adam Wierman (California Institute of Technology)

DATE: Wednesday, April 16, 2014

TIME: 12:15 PM – 1:45PM (Lunch at 12:00 pm)

PLACE: KMC 3-120

ABSTRACT

Everyone has heard the statistics about how much of an energy hog IT has become: The emissions of a server are nearly that of a car! The electricity usage of data centers is growing 12 times faster than that of the US as a whole! Given the significant energy consumption of data centers, improving their energy efficiency is an important social problem. However, energy efficiency is necessary but not sufficient for sustainability, which demands reduced usage of energy from fossil fuels. In this talk, I will describe some recent work highlighting the algorithmic challenges associated with "greening" data centers. We will focus on two applications:(i) dynamic resizing within a data center; and (ii) geographical load balancing across an Internet-scale system. In both contexts I will present our new algorithms, which provide significantly improved performance guarantees when compared with the "standard" approaches using Receding Horizon Control. Additionally, if time allows, I will briefly discuss the our recent progress toward the implementation and evaluation of these algorithms in HP data centers, and the use of these algorithms within demand response markets.

BIO:

Adam Wierman is a Professor in the Department of Computing and Mathematical Sciences at the California Institute of Technology, where he is a member of the Rigorous Systems Research Group (RSRG) and runs a popular blog titled "Rigor & Relevance". His research interests center around resource allocation and scheduling decisions in computer systems and services. He received the ACM SIGMETRICS Rising Star award in 2011, and has been co-recipient of best paper awards at ACM SIGMETRICS, IEEE INFOCOM, IFIP Performance, the IEEE Green Computing Conference, the IEEE Power and Energy Society General Meeting, and ACM GREENMETRICS. He was named a Seibel Scholar, received an Okawa Foundation grant, and received an NSF CAREER grant. Additionally, he has received multiple teaching awards, including the Associated Students of the California Institute of Technology (ASCIT) Teaching Award.