

# Columbia University Department of Electrical Engineering & IDSE Seminar

**Matthew Andrews**  
Alcatel-Lucent Bell Labs

**Friday, September 27, 2013, 11AM-12PM**  
**EE Conference Room – Mudd 1300 Suite**

**Abstract:** In recent years there has been growing interest in using Call Detailed Records (CDRs) to understand user behavior in wireless networks. Typical studies examine user mobility patterns or social interactions via mobile call graphs. In this talk we discuss ways in which we can use CDRs to understand how users respond to the pricing features of their wireless service plan. Such information allows network operators to better tailor plans to individual needs. The talk is divided into 3 parts. In the 1st part we examine a data set of prepaid voice CDRs and show how users vary their behavior as they approach their quota limits. This enables us to categorize users based on their price sensitivity. In the 2nd part we discuss ways in which these models for voice users can be extended to both prepaid and postpaid data users. In the final part of the talk we present a concept known as 2-sided pricing which is gaining increasing attention. With 2-sided pricing content providers can “sponsor” their content so that it becomes free to end users and hence more likely to be accessed. We briefly describe one model for 2-sided pricing and discuss how an analysis of CDRs could be used to derive the parameters of the model.

This is joint work with Glenn Bruns, Hyoseop Lee, Ulas Ozen, Marty Reiman & Qiong Wang.

**Bio:**Matthew Andrews is a Distinguished Member of Technical Staff at Alcatel-Lucent Bell Labs. His research interests include combinatorial optimization, operations research and data analytics, with applications to resource allocation and revenue management in wireless networks, energy-efficient telecommunications and the analysis of large graphs. He is currently studying pricing strategies for mobile data networks that can help operators cope with the rapid increase in network demand. A particular interest is how to optimize the design of such strategies via an analysis of network data sets. He is serving as program chair for WiOpt 2014 and he was a recipient of the best paper award at the 2010 IEEE Symposium on Foundations of Computer Science (FOCS). He received a BA in Mathematics with first-class honors from the University of Oxford in 1993 and a PhD in the Theory of Computing from MIT in 1997.

