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## *Peer-to-Peer Video Streaming: Opportunities and Challenges*

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### Abstract:

Enabling ubiquitous, cost-effective large-scale Internet video broadcasting has remained an elusive goal for networking researchers. While earlier efforts centered around IP Multicast, these have met with limited success due to concerns regarding scalability, deployment, and support for higher level functionality. Recently, peer-to-peer based broadcast has emerged as a promising alternative. While peer-to-peer applications such as file download and voice over IP have gained tremendous popularity, video broadcast is still in its early stages and its full potential remains to be seen.

In this talk, I will begin with an overview of the state-of-the-art of P2P Internet video broadcast. This includes a discussion of the major design issues, key approaches that researchers have taken, and challenges and open problems. I will then discuss our recent work at Purdue on the design of a contribution-aware broadcasting system in access-bandwidth scarce and heterogeneous environments. Finally, I will talk about our ongoing work that exposes how P2P systems can be exploited to cause DDoS attacks on the Internet, and highlights the need for robust membership management design.

### Bio:

Sanjay G. Rao is an Assistant Professor in the ECE Department at Purdue University, where he leads the Internet Systems Laboratory. His research interests are in Networking, more specifically in Peer-to-Peer systems, and Network Management. He received the Bachelor's degree in Computer Science and Engineering from the Indian Institute of Technology, Madras, and the Ph.D from the School of Computer Science, Carnegie Mellon University in 2004. He was a visiting researcher in the Network Measurement and Management group at AT&T Research in Summer 2006. He has played a leadership role in the End System Multicast project - the project pioneers P2P live-streaming, which is now a mainstream research area and an emerging commercial sector. His research is funded by the NSF Cybertrust and NeTS programs, Cisco, and AT&T. He has served on the Technical Program Committees of several workshops and conferences including IEEE Infocom and ACM Sigcomm.

For more details, please see:

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