

# SEMINAR NOTICE

Department of Electrical and Systems Engineering

## How to Visualize Multiterminal Source Coding

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**Abstract:** In the six decades since Shannon, source coding theory has witnessed tremendous progress. Major milestones include Slepian and Wolf's generalization of Shannon's one-terminal lossless problem to the multiterminal setting, and Wyner and Ziv's quantification of the effect of decoder side information on Shannon's rate-distortion problem. Yet, the present state of source coding theory still remains unsatisfactory. For instance, given a solved problem, one often does not know the effect of adding one extra source, or the effect of availability of decoder side information. A further mystery is why the two-source lossy coding problem due to Berger and Tung remains unsolved, whereas a similar Berger-Yeung problem, where one of the sources is perfectly reconstructed, is easily solved. In this backdrop, we shall propose a canonical theory of multiterminal source coding that brings a variety of problems under a unified framework, and proposes a corresponding method of graphical visualization. As a consequence, multiterminal problems are divided into amenable and intransigent categories, which explains why some of the problems are hard to solve, as well as solves certain longstanding problems such as the single-helper problem. Additionally, we shall quantify the effect of additional sources and decoder side information in an arbitrary multiterminal setting.

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Host: Joseph O'Sullivan

**Short Bio:** Soumya Jana received his PhD from the University of Illinois in 2005. Since then he continued at Illinois as a postdoctoral research associate. His research interests include multiterminal source coding, transform coding, and decision theory.