



10th Annual Shannon Memorial Lecture

To commemorate the achievements of Claude Elwood Shannon an endowed lectureship has been established at the University of California, San Diego.

Each year an outstanding information theorist will be selected to present the Shannon Memorial Lecture. The date of the lecture will be on or about Shannon's birthday (April 30th).

A bust of Shannon, situated in the lobby of the Center for Magnetic Recording Research, bears a plaque with the following inscription:

Claude Elwood Shannon (1916-2001) Father of Information Theory

"His formulation of the mathematical theory of communication provided the foundation for the development of data storage and transmission systems that launched the information age"

— Dedicated October 16, 2001. Eugene Daub, sculptor.

May 3, 2012

Prof. Shlomo Shamai

Technion-Israel Institute of Technology
2011 Claude E. Shannon Award Recipient

will present a lecture entitled

Gaussian Interference Channels: An Information-Estimation Perspective

The information-estimation relation is used to gain insight into useful coding schemes operating over the Gaussian interference channel.

After reviewing basic information-estimation relations and their implications on point-to-point coding over the Gaussian channel, we focus on the Gaussian interference channel. Here the inflicted interference is measured by the associated minimum mean square error (MMSE). Structure of codes achieving reliable communication at some specific signal-to-noise ratio (SNR) and constrained by the permitted MMSE at a lower SNR values, modeling the interference, are discussed. It is shown that layered superposition codes attain optimal performance, providing thus some engineering insight to the relative efficiency of the Han Kobayashi coding strategy.

The Degrees-of-Freedom (DoF) behavior of the multi-user Gaussian interference channel is captured by considering the MMSE-Dimension concept, providing a general expression for the DoF. A short outlook concludes the presentation, addressing also recent results, where interference is measured by the corresponding mutual information.



3:00 PM – Reception
4:00 PM – Lecture
Calit2 Auditorium - Atkinson Hall
University of California, San Diego

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