

DISTINGUISHED SEMINAR

Illinois Center for Wireless Systems



Information Theory of Wireless Networks: A Deterministic Approach

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Abstract: Gaussian channels are commonly used models for multiuser wireless communication. Unfortunately, the capacity of multiuser Gaussian channels is unknown even for simple networks such as the single-relay channel and the two-user interference channel. To make further progress in understanding how to optimally communicate over these and more general networks, we propose a deterministic channel model which focuses on the interaction between the users rather than the noise in the system. We show the analytical simplicity of this model by computing the capacities of several interference and relay networks based on this deterministic model.

Biography: Professor David Tse received the B.A.Sc. degree in systems design engineering from University of Waterloo, Canada in 1989, and the M.S. and Ph.D. degrees in electrical engineering from Massachusetts Institute of Technology in 1991 and 1994 respectively. From 1994 to 1995, he was a postdoctoral member of technical staff at A.T. & T. Bell Laboratories. Since 1995, he has been at the Department of Electrical Engineering and Computer Sciences in the University of California at Berkeley, where he is currently a Professor. He received a 1967 NSERC 4-year graduate fellowship from the government of Canada in 1989, a NSF CAREER award in 1998, the Best Paper Awards at the Infocom 1998 and Infocom 2001 conferences, the Erlang Prize in 2000 from the INFORMS Applied Probability Society, the IEEE Communications and Information Theory Society Joint Paper Award in 2001, and the Information Theory Society Paper Award in 2003. He was the Technical Program co-chair of the International Symposium on Information Theory in 2004, and was an Associate Editor of the IEEE Transactions on Information Theory from 2001 to 2003. He is a coauthor, with Pramod Viswanath, of the text "Fundamentals of Wireless Communication". His research interests are in information theory, wireless communications and networking.

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