

情報学基礎セミナー

クン・ヤオ教授特別講演

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京都大学本部構内 総合研究 8 号館 講義室 2



WIRELESS FADING COMMUNICATION SYSTEM PERFORMANCE EVALUATIONS: Using SIRP AND SDP Approaches

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Abstract

Many statistical models are available for the non-line-of-sight flat-fading wireless communication channel. It is of great interest to evaluate performance bounds of wireless communication systems whose channel statistics cannot be modeled with certainty. In the past, we have proposed a unified theory for modeling the non-line-of-sight flat-fading channel envelopes based on the spherically invariant random processes (SIRP). We have also advocated the use of moment-bound theory to obtain bounds on these performance metrics. However, these bounds may be very loose when only limited prior knowledge of the channel is available, typically in the form of moments and of the type of probability distribution of the channel fading. In this seminar, we combine the theory of moment bounds with that of SIRP, and use semi-definite programming (SDP) to show how sharper bounds of the error rate of a communication system can be computed.

Biography

Kung Yao received the B.S. (Summa Cum Laude), M.A. and Ph.D. degrees in electrical engineering all from Princeton University, Princeton, N.J. Then he was a NAS-NRC Postdoctoral Fellow at UC Berkeley. Presently, he is a Distinguished Professor in the Electrical Engineering Department at UCLA. His research and professional interests include: 4G cellular network system, digital communication theory and system, and beamforming in sensor array systems, and simulations. He received the IEEE Signal Processing Society's 1993 Senior Award in VLSI Signal Processing, the 2008 IEEE Communications Society/Information Theory Society Joint Paper Award, and the 2012 JCN Best Paper Award. He is a Life Fellow of IEEE. He is the lead co-author of the book, "Detection and Estimation in Communications and Radar Systems," published by Cambridge University Press, in 2013.