



Cornell University

Information, Systems, and Networks seminar

Exact Asymptotics and Moderate Deviations in Channel Coding

Rhodes Hall 310: November 14, 2012 @ 12:00PM



ISN Seminar Speaker:

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Abstract

This talk is about two new asymptotics in channel coding: Exact asymptotics and moderate deviations.

In the exact asymptotics, we concentrate on the sub-exponential factors of the well-known exponentially decaying bounds on the error probability and overview our recent refinements of the sphere-packing and random-coding bounds. The order of sub-exponential factors of these refinements almost coincide in general, and are equal for the case of symmetric channels.

In the moderate deviations, we consider the optimal error performance of the sequence of codes with rates increasing to the capacity and prove that for a particular regime of increase, the error probability vanishes sub-exponentially fast with a rate related to the dispersion of the channel.

Finally, we state a conjectured asymptotic expression of the error probability that unifies error exponents, moderate deviations, exact asymptotics and normal approximation regimes.

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Biography

Yücel Altuğ received B.S. and M.S. degrees in Electrical and Electronics Engineering from Boğaziçi University, Turkey, in 2006 and 2008, respectively. He is currently a fifth year Ph.D. student in the School of Electrical and Computer Engineering at Cornell University working under Aaron Wagner and a visiting graduate student in the Department of Electrical Engineering at Princeton University, hosted by Paul Cuff. His main research interest is information theory, in particular Shannon theory. He also works on large deviations theory and mechanism design.