

**THURSDAY
OCTOBER 18, 2007**

**Scaife Hall Auditorium
Room 125**

**4:30 p.m.
Refreshments—4:00 p.m.**



Babak Hassibi

**ASSOCIATE PROFESSOR
CALIFORNIA INSTITUTE OF TECHNOLOGY**

Babak Hassibi is an associate professor and vice-chairman of the electrical engineering department at the California Institute of Technology, where he has been since 2001. From 1998 to 2001 he was a member of the technical staff in the Mathematical Sciences Research Center at Bell Laboratories, Murray Hill, NJ and prior to that he obtained his PhD in electrical engineering from Stanford University. His research interests span different aspects of communications, signal processing and control, and he has co-authored three books and numerous papers in these areas. He is a recipient of an Alborz Foundation Fellowship, the 1999 O. Hugo Schuck best paper award of the American Automatic Control Council, the 2002 National Science Foundation Career Award, the 2003 David and Lucille Packard Fellowship for Science and Engineering, the 2003 Presidential Early Career Award for Scientists and Engineers (PECASE), and was a participant in the 2004 National Academy of Engineering "Frontiers in Engineering" program. He was an Associate Editor for Communications of the IEEE Transactions on Information Theory during 2004-2006, and is currently an Editor for the Journal "Foundations and Trends in Information and Communication".

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Wireless Erasure * Networks

As RF technology advances and wireless devices become more and more ubiquitous, there has been a growing interest in the study of wireless networks. However, due to the physical vagaries of the wireless medium (fading, path-loss, delay-spread, interference, mobility, etc.), as well as the unsolved nature of even the most basic multi-user information theory problems, a general theory for communication over wireless networks--apart from very special asymptotic results--is still well beyond reach.

In this talk, we propose a very simple model called the "wireless erasure network" where links are possibly correlated erasure channels. Such models may be appropriate for systems where communication is packet-based and where some form of error correction is used to detect packet erasures. This network model allows one to obtain exact capacity results--independent of the network topology--for certain communication problems, such as those with single source and multiple destinations all requiring the same information. We will study the role of feedback in such networks, as well as connections to areas such as network coding and rateless codes. Finally, we argue that such network models may also be appropriate for distributed estimation and control over wireless networks and obtain a few preliminary results in this regard.

*Work done in collaboration with Amir Dana, Radhika Gowaikar, Vijay Gupta, Richard Murray and Brian Smith.