

University of Illinois  
130 Coordinated Sciences Laboratory  
1308 W Main St, Urbana, IL - 61801

# Vignesh Sethuraman

vsethura@uiuc.edu

Office: (217) 333-3862  
Home: (217) 377-8811  
Fax: (217) 244-1642

## Objective

Seeking an internship position for Summer 2005 in the field of Wireless Communication and Communication Networks.

## Academic Background

Ph.D. in Electrical Engineering current  
**University of Illinois, Urbana Champaign** GPA: 4.00/4.00  
Advisor: Prof. Bruce Hajek

M.S. in Electrical Engineering October 2003  
**University of Illinois, Urbana Champaign** GPA: 3.96/4.00  
Thesis: Capacity per Unit Energy of Fading Channels with a Peak Constraint

B.Tech. in Electrical Engineering July 2001  
**Indian Institute of Technology (IIT)-Madras, India** GPA: 9.0/10  
Thesis: Channel Acquisition and Synchronization Algorithms for TETRA-ETSI wireless systems.

## Work Experience

**Graduate Research Assistant:** Fall '01 – Summer '04  
Graduate Advisor: Prof. Bruce Hajek, ECE Dept., UIUC.

Calculated upper and lower bounds on capacity of wireless channels with correlated fading in the presence of an average and a peak power constraint.

Analyzed performance bounds on Bit-Interleaved Coded Modulation systems for correlated fading channels in the high SNR regime.

Calculated the capacity per unit energy of wireless channels with correlated fading, in the presence of a peak constraint, and identified an optimal input signaling scheme. Studied the impact of correlation in fading on channel capacity.

**Interim Engineering Intern, QUALCOMM** May '03 – Aug '03  
Supervisor: Da-shan Shiu.

Worked on symbol metric scaling at the receiver for enabling High Speed Downlink Packet Access (HSDPA) in a 3G WCDMA system.

**Research Assistant:** Summer '00  
Research Advisor: Prof. Vinod Sharma, ECE Dept., Indian Institute of Science.  
Worked on capacity issues of wireless channels in a cellular network setup.

## Journal Publications

Vignesh Sethuraman and Bruce Hajek, "Capacity per Unit Energy of Fading Channels with a Peak Constraint," submitted to IEEE Transactions on Information Theory.

## Conference Publications

Vignesh Sethuraman, Bruce Hajek and Krishna Narayanan, "Capacity Bounds for noncoherent fading channels with a peak constraint," submitted to IEEE International Symposium of Information Theory, 2005.

Vignesh Sethuraman and Bruce Hajek, "Capacity per unit energy of fading channels with a peak constraint," Proc. of the IEEE International Symposium of Information Theory, June 2003, Yokohama, Japan.

## Projects

- Simulated a wireless channel with correlated fading to study the optimality of a discrete input symbol set at different SNR levels using Monte Carlo routines.
- Determined an upper bound on the energy efficiency of digital gates with Deep sub-Micron Noise channels (CMOS Technology), using an information-theoretic approach.
- Studied the tradeoff between reliability, energy-efficiency and information rate in VLSI systems.
- Simulated Distance Vector Routing and Link State Routing using Posix Threads to study the relative merits of the popular routing protocols used in the Internet.

## Computer Skills

*Packages:* Mathematica, Matlab, Cadence and Synopsys CAD tools (VLSI), Verilog XL

*Languages:* C, C++ (Network Programming), Perl

*Platforms:* Windows, Linux, Solaris, OpenBSD

## Achievements

Recipient of Vodafone - U.S. Foundation Graduate Fellowship towards research and education in Wireless Communication.

Recipient of Engineering Fellowship (JNCASR '00) awarded by the Govt. of India  
All India Rank of 108 in the 1997 entrance examinations (IIT-JEE) for Indian Institutes of Technology