



Vijay Ganwani
Electrical Engineering
Indian Institute of Technology, Bombay
Specialization: Communication Engineering

06307R09
M.Tech.
Male
DOB: 07-04-1982

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2008	7.64
Undergraduate Specialization: Industrial Electronics				
Graduation	Pune University	Bharti Vidyapeeths COE, Pune	2004	60.20
Intermediate/+2	Maharashtra Board	Fergusson College, Pune	2000	70.50
Matriculation	C.B.S.E	D.A.V A.C.C Public School, Katni	1998	65.80

M. Tech Project: Cooperative Diversity for Wireless Communication Systems

Cooperative diversity was conceived as an alternative to traditional MIMO systems when it is not possible to have large number of antennas at the mobile device. Diversity or, the improvement in system performance due to multiple paths in a fading channel was achieved through a set of relays cooperating with each other. The relays may be stationary or mobile, with the mobile users acting as relays for each other, provided they satisfy certain power requirements. Popular relaying methods are amplify and forward (AF) and decode and forward (DF). Cooperative diversity has been proposed by the IEEE 802.16m working group for the metropolitan area network (MAN). The performance of the AF method with multiple antennas at each relay, also known as MIMO-relay was analyzed.

- **Publication from M.Tech project:**

G V V Sharma, Vijay Ganwani, Uday B. Desai and S. N. Merchant, " Maximum Likelihood Detection for Cooperative Diversity in MIMO Relay Channels," Accepted for publication in IEEE 65th Vehicular Technology Conference (VTC), Fall 2008.

M. Tech Seminar: Penalty based approaches for spectrum access in unlicensed band

Devices in the unlicensed band tend to be greedy resulting in poor utilization of spectrum. Certain penalty based approaches were presented which penalizes the devices based on its previous usage. This scheme through simulation showed far better improvement in spectral efficiency.

M. Tech Course Projects:

- **Implementation of Wimax physical layer**

Almost all standards for wireless communications mandate the use of error control codes to reduce the effect of distortions introduced by the communication channel. In this project, the viterbi algorithm, for convolutional codes was implemented. The Reed Solomon code that constitutes one of the blocks of channel error correction strategy was also incorporated.

- **Implementation of LPC encoder and decoder**

Successfully analyzed and synthesized LPC encoder and decoder with different audio signals and achieved the compression ratio of 3:1.

- **Implementation of Adaptive filters**

Applications like noise cancellation, adaptive equalization and system modeling were dealt with the help of LMS, NLMS, and RLS adaptive filters.

- **Implementation of Image restoration and enhancement techniques**

- 1) Designed and developed Weiner filter in C and restored image perturb by AWGN (Additive White Gaussian Noise) and motion blur.
- 2) Implemented different morphological techniques.
- 3) Studied and analyzed the paper on artistic picture enhancement which involves generation of painting like artifacts to any input image.

- **Implementation of networking protocols**

- 1) Successfully implemented and analyzed throughput of RIAS (Ring Ingress Aggregated with Spatial reuse) scheduling algorithm.
- 2) Studied and analyzed performance of TCP over wireless using NS-2.

- **Implementation of Google's PageRank algorithm**

Successfully implemented Google's PageRank algorithm, which ranks the importance of web pages according to an eigenvector of a weighted link matrix.

Work Experience:

- Worked as an embedded firmware engineer for a year (Aug '05 to Aug '06) with BioEnable Technologies, Pune which develops applications for biometrics and wireless products such as finger print scanners and GSM/GPRS modems among others. The hardware platform was 8-bit Rabbit 3000 processor. Following three major projects were undertaken:
 - 1) **NET-SAT-GEO:** Involves tracking of vehicles, which includes locating position, speed and any external events like door left open, accident intimation etc. Developed and designed for OMCI, Italy.
 - 2) **iSmart:** Involves sampling digital and analog inputs and uploading its status to HTTP server through GSM/GPRS modem. Developed and designed for Energinet, Norway.
 - 3) **TimeScan v1000:** TCP/IP based time attendance system with an interface of finger print scanner, mi-fare card reader and keypad.
- Undergone a six months training course in embedded systems from United Telecom Ltd., Pune.
- Currently working as project research associate in SPANN Lab, IIT Bombay.

B. E Project: Home Networking Using DTMF (Dual Tone Multiple Frequency) Technology

The project was based on DTMF technology with the objective to control home appliances using telephone (either mobile or landline) from anywhere around the world. One can control five devices simultaneously connected in parallel. The project was sponsored by MCEME (Military College of Mechanical Engineering), Hyderabad.

Key Courses Undertaken: Digital signal processing, Adaptive signal processing, Image processing, Statistical signal analysis, Communication networks, Information theory and coding, Wireless and mobile communication, Real and Complex analysis.

Achievements and Extra Curricular Activities:

- Captain of hostel table tennis team for inter-hostel T.T. tournament.
- Captain of Electrical department table tennis team for PG sports tournament 2008.
- Received certificate with 'VERY GOOD' performance in the course on 'Advance programming in C++' conducted by IIT Bombay.
- Awarded highest grade AA for Stage/Phase I of MTP.
- Recognized for performance based incentive while working at Bioenable Technologies, Pune.

Skill Set:

- Strong C/C++ fundamentals, SQL
- TCP/IP Concepts, Linux socket programming and NS-2
- CMX RTOS
- Dynamic C 8.61 IDE, Keil μ Vision 2 IDE and Matlab
- I2C, SPI, UART, CAN Specifications and Implementation
- Latex, Doxygen

Responsibilities Held:

- Member of SPANN core group and allotted the task of Web maintenance.
- Coordinated in farewell "Comm. Valfi 2008" party.