



**T. Pranava**  
**School of Biosciences & Bioengineering**  
**Indian Institute of Technology, Bombay**  
**Specialization: Biomedical Engineering**

**10330010**  
**M.Tech.**  
**Female**  
**DOB: 17/09/1989**

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2011	9.25
Undergraduate Specialization: Biomedical Engineering				
Graduation	Anna University	SSN College of Engineering	2010	85.00
Intermediate/+2	CBSE	KCP SARP School, Vijayawada	2006	82.60
Matriculation	CBSE	KV 2, Kalpakkam	2004	85.20

#### KEY ACADEMIC PROJECTS AND INTERSHIPS

**Post-Graduate Thesis: Suppression of Artifacts in ECG and ICG signals** [May 2011 – Till Date]

**Guide:** Prof. P. C. Pandey, Department of Electrical Engineering, IIT Bombay

- Designed and developed “**ECG Denoiser Version 1.0**”, a user interface application in Lab Windows/CVI for ECIL (Electronics Corporation of India Ltd.), Hyderabad
- Investigating and improvising Wavelet based thresholding techniques for suppression of EMG and Respiratory Artifacts in Electrocardiogram (ECG) and Impedance Cardiogram (ICG) signals
- Investigating and improvising Wavelet based clipping techniques for removing Motion Artifacts
- Implementation of the algorithm in DSP Processor

**Undergraduate Thesis: Performance Evaluation of EEG based Sleep Onset Detection and Correlation with MEG Sleep Parameters;** Project done at “*Indira Gandhi Centre for Atomic Research*” [Jan. – Apr. 2010]

**Guide:** Asst. Prof. N. Sivaramakrishnan, Department of Biomedical Engineering, SSN College Engineering

**Co-Guide:** Dr. M. P. Janawadkar, Head, SQUIDS and Applications, CMPD, MSG, IGCAR, Kalpakkam

- Conceptualized and developed a wavelet based algorithm for detecting the onset of sleep even before the closure of eye lids for drivers; created a graphical user interface (GUI) in Matlab
- Analyzed and performed a comparative study of results obtained from Electroencephalogram (EEG) and Magneto-encephalogram (MEG)
- Trained in EEG acquisition using 10-20 electrodes recording system and MEG acquisition using 4 channel Superconducting Quantum Interference Devices (SQUIDS) sensor system at IGCAR

**Hospital Training:** Undergone hospital training in the Departments of Cardiology, Biomedical, Neurology and Nephrology at Sri Ramachandra Hospital, Chennai [Oct. 2009]

#### MAJOR SCHOLASTIC ACHIEVEMENTS

- Secured **2<sup>nd</sup> Rank** in **M. Tech Biomedical Engineering** at IIT Bombay [2010 – 2011]
- Secured **5<sup>th</sup> University Rank** in B.E. Biomedical Engineering at Anna University [2006 – 2010]
- Awarded **Chairman’s Gold Medal** for securing highest aggregate marks in Anna University [May 2010]
- Awarded **Merit Scholarship** by SSN Institutions [2008 – 2009]
- Awarded **Gold Medal** for securing **1<sup>st</sup> rank** in 3<sup>rd</sup> semester of Anna University examinations [Dec. 2007]
- Secured **14<sup>th</sup> Rank** in Kendriya Vidyalaya Sangthan Fifth Jr. Mathematics Olympiad [2003 – 2004]

#### CO-CURRICULAR ACTIVITIES AND POSITIONS OF RESPONSIBILITY

- Vice President of IEEE EMBS SSN Student Chapter** [2009 – 2010]
  - Involved in conceptualization, planning and execution of various technical activities of IEEE
- Secretary of IEEE EMBS SSN Student Chapter** [2008 – 2009]
  - Interacted and co-ordinated with hospitals and research institutes for conducting chapter activities
- Member of organizing committee “SHRISTI”, a National Technical Symposium of SSN College** [Aug. 2010]
- Volunteered for conducting “2<sup>nd</sup> International Conference on Biomedical Informatics and Signal Processing”** in association with SBRI, UMDNJ (New Jersey), and SSN Institutions [Mar. 2009]
- Organized a workshop on “Scope and Applications of Biomedical Engineering”** [Mar. 2008]
- Teaching Associate of “Virtual Instrumentation using Lab Windows” at IIT Bombay** [July 2011 – Till Date]
  - Responsible for planning and conducting labs, designing projects/problem statements, guiding students

## COURSE PROJECTS

### EEG Epileptic Seizure Detection

[July – Oct. 2010]

**Supervisor:** Prof. V.M. Gadre, EE Dept., IIT Bombay

**Course:** Digital Signal Processing

- Developed a methodology for classification of epileptic and non-epileptic EEG
- Studied the performances of different time and frequency domain features of EEG
- Implemented the classification algorithm using Multi-Layer Perceptron neural network

### QRS Detector

[Aug. – Nov. 2010]

**Supervisor:** Prof. P.C. Pandey, EE Dept., IIT Bombay

**Course:** Electronic System Design

- Designed and implemented an electronic circuit for extracting QRS complexes from ECG signals
- Developed circuit showed better performance even under high noise conditions

### Real Time Heart Rate Monitoring and Analysis

[Nov. 2010]

**Supervisor:** Prof. Soumyo Mukherji, BSBE Dept., IIT Bombay

**Course:** Virtual Instrumentation

- Developed a real time application to acquire and detect abnormalities of ECG signals
- Estimated the heart rate and modeled a drug level indicator using Lab Windows

### Denoising of 2D Gel Electrophoresis Images using Wavelet Techniques

[Jan. – Mar. 2011]

**Supervisor:** Prof. V.M. Gadre, EE Dept., IIT Bombay

**Course:** Wavelets

- Studied and analyzed the performance of different non-linear thresholding techniques
- Performed comparative analysis on application of separable and non-separable wavelets in denoising

### Microcontroller based Programmable Function Generator

[Jan. – Apr. 2011]

**Supervisor:** Prof. P.C. Pandey, EE Dept., IIT Bombay

**Course:** Embedded System Design

- Designed a function generator to generate test signal such as sine, triangular, square and saw tooth wave
- Implemented features such as amplitude, offset, frequency, sweep limits and sweep rate adjustments

### Echocardiogram based Classification of Survival of Patients for atleast one year after a Heart Attack

**Supervisor:** Prof. S. Arun Kumar, CS Dept., IIT Bombay

**Course:** Biostatistics

[Mar. – Apr. 2011]

- Studied and compared the dependency of various parameters – age, wall motion index, precardial effusion, and fractional shortening – obtained from Echocardiogram on the survival of patients after heart attack
- Performed 1-way, 2-way ANOVA and multiple ANOVA for validation of the studies

### Brain Tumor Detection in MRI Images

[Aug. – Sept. 2011]

**Supervisor:** Prof. Subhasis Chaudhuri, EE Dept., IIT Bombay

**Course:** Image Processing

- Studied the sensitivity and selectivity of various edge detection methods for brain tumor detection

## RELEVANT COURSES

**Communication and Signal Processing:** Digital Signal Processing, Wavelets, Image Processing

**Electronics:** Analog and Digital Circuits, Electronic System Design, Embedded System Design, Sensors and Transducers

**Programming:** Virtual Instrumentation of Biomedical Engineers, Visual Programming

**Biomedical:** Human Anatomy and Physiology, Biomedical Instrumentation, Diagnostic and Therapeutic Equipments, Biomaterials, Biomechanics, Electrodiagnostics, Medical Imaging Techniques

**Mathematics and Statistics:** Biostatistics, Probability and Random processes

**Other Subjects:** Artificial Intelligence and Pattern Recognition, Artificial Neural Networks, Intellectual Property Rights

## SKILLS AND TOOLS

**Operating Systems:** Windows, Linux

**Tools/Software:** Microsoft Office (Word, Excel, PowerPoint, Access, Project, Visio, OneNote), Keil, Protel

**Languages:** C, C++, Visual Basic, Visual C++, Matlab, Labview, Lab Windows

**Microprocessors and Microcontrollers:** 8085, 8086, 8051, 80C251, ARM

## EXTRA-CURRICULAR ACTIVITIES

- **Head of Project Building Team** of ‘Techshiksha’, an initiative by IIT Bombay alumni to promote learning science in an innovative way among school students [Sept. 2010 – Till Date]

➤ Promoted the importance of learning by experimentation, **designed projects** for students, **organised workshops**

- **Represented** the department in **Chess and Carrom** matches at **PG Sports**, IIT Bombay [2010 – 2011]

- **Trained** in **Basic Life Support and First Aid Skills** and **Basic Fire and Emergency Preparedness** [Dec. 2009]

- **Organized** a **One Day – Social Awareness Health Camp** for free eye and dental screening tests in association with Dr. Agarwal’s Eye Hospital and Sree Balaji Dental College [Mar. 2009]