Parin Mangal Chheda | **153076005**
Electrical Engineering | **M.Tech.**
Indian Institute of Technology Bombay | **Male**
Specialization: Electronic Systems | **DOB: 8-10-1991**

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2018	8.22
Undergraduate Specialization : Electronics Engineering				
Graduation	University of Mumbai	K.J. Somaiya College of Engineering	2013	70.49
Diploma	Electronics and Telecommunication	Thakur Polytechnic	2010	85.64
Matriculation	SSC	Aspee Nutan High School	2007	88.61

AREAS OF INTEREST

Embedded Systems, Energy Harvesting, Internet of Things

TECHNICAL SKILLS

- **Languages**: C/C++, Python, Bash, VHDL
- **Tools & IDEs**: Git, LaTeX, Atmel Studio, Code Composer Studio, Eagle, Quartus, MATLAB

MAJOR PROJECT AND SEMINAR

- **Design of IoT based Energy efficient subsystem for greenhouse** (*M.Tech Project*) *[Jun'17 - present]*
  (Guide: Prof. Kavi Arya)
  - **Idea**
    - A **closed loop** irrigation control system for urban farming to promote optimum growth.
    - A low power sensor node with **solar energy harvesting** capability and an actuator for drip irrigation.
    - Part of a low maintenance and affordable solution for sustainable urban farming.
  - **Completed Work**
    - Studied about solar harvesting power supply design and **duty cycling** for low power operation.
    - Modified an existing **Wifi** based **solenoid valve** controller for single battery low power operation.
  - **Ongoing and Future Work**
    - Design of solar harvesting power supply for a sensor node and requirements for **energy neutrality**.
    - **Real time monitoring** of soil moisture for closed loop control of irrigation.
    - Analyzing an **Evapotranspiration** estimation model and its effectiveness in irrigation scheduling.
- **Study of Energy Harvesting for Embedded Systems** *(Seminar)* *[Jan'17 - Apr'17]*
  (Guide: Prof. Kavi Arya)
  - Surveyed the different **ambient energy** sources available and their harvesting potential.
  - Practically examined the **V-I characteristics** of 6V, 200 mA solar panel in different levels of illuminance.
  - Built a **data logging device** to measure the current output from the solar panel.

WORK EXPERIENCE

e-Yantra, Department of Computer Science & Engineering, IIT Bombay *[February 2014 - present]*
Senior Project Technical Assistant

- Conducted **9** two-day workshops covering the basics of an **Atmega2560** based Robotics and Embedded research platform for teachers of engineering and polytechnic colleges in different regions of the country.
- Intergral part of the e-Yantra Lab Setup Initiative (eLSI) team, responsible for setting up Robotics and Embedded Systems labs in **208** colleges across the country.
- Conceptualized and implemented a module based online learning method **(Task Based Training)** for teachers on basics of Embedded systems along with another team member.
- Created learning modules for Task Based Training and successfully **coordinated** with a team to complete **five** editions of this online training.
- Key member of a team involved in organizing and handling an annual **e-Yantra Symposium (eYS)** having representation from **100+** colleges for the last two years.
- Streamlined routine communication flows and data collection for interaction with engineering colleges.
- Core member of a team that developed **Themes** (real-world problems abstracted into games) based on Valet Parking and Plant Growth Monitoring as challenges for teachers after completing Task Based Training.
- Created a Fire Fighting Robot Theme in a team of three, for the national level e-Yantra Robotics Competition (eYRC) for students.

RELEVANT COURSES

- **Embedded**: Electronics System Design, Embedded System Design, Sensors in Instrumentation, Software Development Techniques for Engineering & Scientists
- **Digital Design**: System Design, VLSI Design Lab, Foundation of VLSI CAD (Ongoing)
- **Signal Processing**: Digital Signal Processing & its Applications, Digital Signal Processing - System Design & Implementation

POSITIONS OF RESPONSIBILITY

- **Teaching Assistant** for Embedded Systems course of Department in Computer Science & Engineering (CS 684) for Autumn Semester, 2016. Assisted in designing lab experiments on the TM4C123G Launchpad for the course.
- Mentor for student internship projects based on sensor interfacing, Internet of things application and **Unit testing** for Embedded C code.
- Member of the core team that **organized** the national level e-Yantra Robotics Competition finals in 2015 and 2016.

COURSE PROJECTS

- **Air Quality Monitoring** *[Jan'17 - Apr'17]*
  (Guide: Prof. Krithi Ramamritham)
  - Designed a **MSP430F5529** based sensor node having a **stackable** design with temperature, humidity, CO and particulate matter (PM 2.5) sensors on-board.
  - PM 2.5 and CO sensor were calibrated using their sensitivity characteristics and the performance of low cost PM 2.5 sensor was **compared** with a commercially available sensor.
- **Image Compression and Wavelets** *[Jan'17 - Apr'17]*
  (Guide: Prof. Sachin Patkar)
  - Prototyped Wavelet based image compression in **MATLAB** and then implemented **2D Haar Wavelet Analysis** filter bank with thresholding in **VHDL**.
  - Built a Nios-II based **Qsys** component on the DE0-Nano **FPGA** development platform for 1D Discrete Haar Wavelet transform.
- **Python API for mobile robot control** *[Jul'16 - Nov'16]*
  (Guide: Prof. Prabhu Ramchandran)
  - Developed a **Python API** along with the corresponding firmware to control a mobile robotic platform using **Raspberry Pi** providing an **abstraction** over Embedded C.
  - The project involved following **coding guidelines** (PEP8), use of version control (Git), **documentation tools** (Sphinx) and **Unit testing** for Python Code.
- **Multiload Dimmer** *[Jan'16 - Apr'16]*
  (Guide: Prof. P. C. Pandey)
  - Implemented a micro-controller based **power control** of multiple loads along with frequency compensation.
  - Supplemented the system with an Android app having ON/OFF, intensity and **intensity-duration** control.
- **Multiband Dynamic Range Compression for Hearing Aids** *[Jul'15 - Nov'15]*
  (Guide: Prof. Vikram Gadre)
  - Built a frequency dependent gain function based on **FFT Analysis** and **Synthesis** for auditory critical bands.
  - The proposed solution was successfully tested on **TMS320C5515** Digital Signal Processor using a pre-recorded sentence.
- **Auto-zeroing Differential Amplifier** *[Jul'15 - Nov'15]*
  (Guide: Prof. P. C. Pandey)
  - Designed a **reset stabilized amplifier** using an internal ADC of a micro-controller for sampling and a serially controlled DAC to generate the compensation voltage for offset nulling.
  - Tested the solution with a differential amplifier having a gain of 100 built using Op-amp IC µA741.

OTHER ACTIVITIES

- Enjoy playing Squash and Cricket.
- Other hobbies include watching Standup Comedy and Squash tournament matches online.