Raj Patel **09D01001**
Aerospace Engineering **UG Third Year(Dual Degree)**
Indian Institute of Technology, Bombay **Male**
DOB: 15/11/1990

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2012	8.72
Intermediate/+2	CBSE	Hillwoods School	2009	89.60
Matriculation	CBSE	JNV Gandhinagar	2007	91.60

ACADEMIC ACHIEVEMENTS

- Secured **1673** All India Rank (99.6 percentile) in IIT-JEE'09 (2009)
- Awarded **certificate of merit** in mathematics for being in top **0.1%** in SSC (10^{th} Class) (2007)
- Awarded **certificate of merit** in mathematics for being in top **0.1%** in AISSCE (12^{th} class) (2009)
- Secured **112** All India Rank at Interactive Maths Olympiad by EDUHEAL FOUNDATION (2008)

FIELDS OF INTEREST

- System Engineering and Designing
- Product Development
- Mechatronics
- Scientific computing
- Control System and Engineering

INTERNSHIP

Optimum placement of Agile Star Tracker and Deconvolution of motion blurred Star images (Dec'11)
Guide: R.S Chandrasekhar, Inertial System Group, RCI DRDO

- Star Tracker determines an absolute attitude of an aerial vehicle using star images in its FOV
- Analysed type of motion blur for various mounting position of imaging sensor
- Quantified the linear spatially invariant motion blur
- Deconvoluted the blurred images using 'Truncated SVD' method based on Fast Fourier Transform
- Optimised the placement of star tracker satisfying electron per pixel and blur requirements

PROJECTS UNDERTAKEN

Containment of blade & disc fragments during a rotor failure in Jet Engine (July'10-Nov'10)
Supervised Learning Project, Guide: Prof. A. M. Pradeep, Aerospace Engineering Department

- Performed extensive Literature survey on containment process developed during period 1970 – 2000
- Studied special test cases of multi-blade interaction and momentum spreading effect
- Analysed various experimental results for different materials subjected to similar conditions
- Learned to decompose a complex aerodynamic system into smaller easily understandable systems

Contribution in the development of PySPH **(**May'11-present**)**
PySPH is a python based open source framework for Smooth Particle Hydrodynamics.

- Job assigned to me was to setup a continuous integration tool which **automates the build cycle**
- Hudson, a java based Continuous Integration tool, equipped with many plugins was used
- Learned **test-driven development** technique for algorithm development
- Currently developing test case on Tsunami problem using in-house python based SPH solver

Multifunctional writing device (July'10-Nov'10)
Engineering Design Course Project, Guide: Prof. Sudhakar, Prof. Mujumdar & Prof. Arya.

- Worked in a team of 7 people in conceptually designing of a multifunctional writing device
- Surveyed responses of over 150 students if allowed to use the device and refined the requirements
- Used techniques such as **Quality Function Deployment** (QFD) as a helping tool

Textbook Companion Project **(**Jan'11-April'11**)**

Initiative of IITB FOSSEE (Free Open source Software for Science and Engineering Education) Group

- The project aims to create a repository of referenced material in the form of solved problems for scientific computing using any open-source tools
- Contributed by writing python code for 80 solved examples for a book by Frank White
- Also learned to use open-source tools like Scilab & Sage (a Python based Mathematics software)

Fingerprint based Unique Identification (UID) System (July'09-Nov'09)

Course Project, Guide: Prof. Dipak Phatak

- Project was inspired by **Aadhar**, which aim at providing a unique identification number to all Indians
- The project aimed to design a Biometric Identification System for the residents of IIT Bombay
- Worked as a part of 20 member's team and contributed by generating in house C++ code to create database for the user

SOFTWARE SKILLS

- **Languages :** C++ , python
- **Packages used:** Matlab, LTspice, Simulink, Scilab, MS Office, sage, Lab View, Latex.
- **Continuous Integration tools :** Hudson
- **Version Control System:** Mercurial
- **Operating System :** Windows and Ubuntu(Linux)

KEY COURSES UNDERTAKEN

Departmental Courses:

- Engineering Design Optimization
- Aerodynamics
- Space Flight Mechanics
- Controls Theory & Controls Lab
- Propulsion
- Mechatronics
- Modelling and Simulation Lab

Other Courses

- Numerical Analysis
- Linear Algebra
- Integral and Differential Calculus
- Analog Electronics
- Computer Programming and Utilization
- Data Analysis and interpretation
- Micro and Macro Economics.

EXTRA-CURRICULAR ACTIVITIES

Technical	• Developed a **2-axis** controllable RC Plane and participated in **Mach Infinity,** competition in **Zephyr** an Aerospace Departmental Festival • Designed **boomerang** which exhibit steady and level flight
Sports	• Awarded **A grade** in High Altitude Trekking by directorate of Mountaineering and Allied Sports Manali. • Participated and Won **Handball Championship** (under 14 age group) at NVS cluster games Meet 2006 • Participated and Won **Handball Championship** (under 17 & 19 age group) at NVS cluster games Meet 2007
Other	• Awarded **Certification of Merit** by Gujarat Council of Science City for securing 1st position in essay writing competition (April 2004) • Secured 2nd prize in essay writing at Festival of Science -2005