Anand Pratap Singh
08D01002
UG Fourth Year(Dual Degree)
Aerospace Engineering
Indian Institute of Technology, Bombay

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Research Interest

Computational Fluid Dynamics, Autonomous Aerial Vehicles, Navigation using Global Positioning System, Controls and Communication.

Projects

- **Python based SPH Solver** May '10 - Dec '10
  Guide: Prof. Prabhu Ramachandran, Dept. of Aerospace,IIT Bombay
  Working on development and implementation of **Python** based Smoothed Particle Hydrodynamics(**SPH**) solver. My work involves writing test cases and comparing it with available bench marks and also suggesting changes based depending on usability of the code.

- **Relative Kinematic Accurate Positioning of ground vehicle using GPS** Dec '09
  Guide: Prof. H. Arya, Dept. of Aerospace, IIT Bombay
  Project involved double diffrencing of **Carrier Phase** to find the relative position. Wrote code in **Matlab** to acquire data from two GPS module simulataneously using RS-232 interface and processing it in real time.

- **Air Navigation using GPS** July '09 - November '09
  Guide: Prof. Hari Hablani, Dept. of Aerospace, IIT Bombay
  Project involved reading about different type of navigation systems used these days, specially about GPS. Understanding its operation, sources of **error and modelling** them in Matlab.

- **System to Locate Ground Water** July '09 - November '09
  Designed a system to locate groundwater for digging wells and borewells. The process involved various **design techniques** like need identification, refinement, stakeholder identification, operational requirements and functional decomposition followed by QFD for analysis.

- **Two axis Stabilization System for RC aircraft, to make flying easy**
  System consisted of an accelerometer, RC remote and receiver, microcontoller(**Atmega32**) interfaced together to perform the task of stabilization. This project involved modelling of system dynamics, designing suitable controller for attitude control , designing circuits using eagle, designing and writing code in c++ for microcontroller.

- **Polynomial Analysis Tool**
  As a part of course project developed a small program on C++ platform. Takes input as n order polynomial and give its graph, roots, maxima-minima, Point of inflection, and behavior of function at the point where the cursor is placed.

- **Study on crash of US AIR 427**
  Performed a detailed study of Air Crash Investigation report of US AIR 427, focussing on the rudder reversal as its cause, and presented the same.

- **History of Oil Prices**
  Studied the variation of oil prices from 1869-2008 and factors affecting them and Also formulated a procedure to predict the oil price at any given time.

Course Undertaken

Aerospace Courses	**Mathematics**
Fluid Mechanics, Aerodynamics	Calculus
Thermodynamics, Propulsion	Data Analysis and Interpretation
Modeling and Simulation Lab, Control Theory	Differential Equations I, Differential Equations II
Control Systems Laboratory	Introduction to Numerical Analysis
Solid Mechanics, Aerospace structural mechanics	

Electronics	**Others**
Signal Processing	Introduction to Biomedical Engineering
Digital Electronics	Electricity & Magnetism, Chemistry
Introduction to Electrical and Electronics Circuits	Computer Programming and Utilization
	Economics, Psychology

Skills

Programming Languages: Python, C/C++, Matlab, Java, html, PHP, css

Operating Systems: Linux, Windows

Microcontroller: Atmel AVR mega16x/32x, PHILIPS P89C51RA2xx/RB2xx/RC2xx/RD2xx s

Extra Curricular

- **Class Representative** of a batch of 47 students.
- Active member of Udaan, a student initiative aimed at fostering enthusiasm towards engineering among lesser privileged high school students.
- As the **Convenor** of **Aeromodelling Club**, organized numerous activities of the Aeromodelling, like workshops, talks, flying sessions, which has greatly helped in instilling enthusiasm among the students.
- Awarded Department Freshman of the Year for all round performance in academics and student activities.
- Won third prize in MachInfinity, Remote Controlled Plane flying Competition in Zephyr 09, Aviation festival of Aerospace Department for designing and flying one of the fastest aircraft model.
- Secured First position in Institute Freshmen Dramatics Competition.
- Secured Third position in Institute Freshmen Football League.