Sant Kumar

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ACADEMIC DETAILS

Examination	Board/University	Institute	Year	CPI/ Percentage
Graduation	IIT Bombay	IIT Bombay	2011-12	9.04/10
Intermediate/+2	Central Board (AISSCE)	Adwaita Mission High School	2011	92%
Matriculation	Central Board (AISSE)	D.A.V. Public School	2009	94%

PROJECTS

1. AUVSI's International Robosub Competition, San Diego, California *(November 2011-ongoing)*
Guide : Prof. Dr. Hemendra Arya and Prof. Dr. Leena Vachhani www.auv-iitb.org

Designing and developing an unmanned autonomous underwater vehicle (AUV) that localizes itself and performs realistic missions based on feedback from visual, inertial, acoustic and depth sensors using thrusters and pneumatic actuators

- **Founding member** of a team of 20 members constructing a state of the art AUV through a period of 19 months and a total budget of **2.2 million INR**
- Working under the following subdivision :
  Electronic Hardware -
  - Modeled the blueprint of the **Electronic Architecture** for maximizing power efficiency and a well planned communication between SBC, Power management board, Motion controller board and various other sensors
  - Designed **Power management** and **Motion controller Boards** on a modular and scalable platform
  Control Systems -
  - Innovated a **5 DOF control structure** for underwater thrusters control using feeback from inertial sensors and cameras
- Represented India at Robosub 2012 with a dream debut performance of reaching **semi-finals**; **ranked 10th** (out of 31 international teams) , **2nd Lightest vehicle** in competition

2. Gravity sensitive Digital cum Analog Watch *(July 2012)*
(IIT-Bombay Electronic Systems Design Workshop)
Hosted by : Learning Labs

- Worked on a state-of-the-art mobile design platform containing the latest RISC processor and configurable logic technologies (http://www.computer.org/comp/proceedings/mse/2007/2849/00/28490145.pdf)
- Programmed a virtual dialed watch on a LCD and using **RTC and SDL nuggets library** (provided on the platform)
- Incorporated **Accelerometer** with the watch, making it Gravity sensitive and working like a spirit level
- Further modified it to show room temperature, humidity and to be used as a stop-watch also

3. Two Wheeled Self Balancing Robot *(Institute Technical Summer Project)*   *(May-June 2012)*
*An **autonomous** two wheeled single axis self balancing robot*
- Designed the **mechanical and electronic hardware alongwith controls** of the robot in the two membered team
- Structured **PID Control Algorithms** on AVR platform
- Was displayed in the Institute Technical Exhibition

4. AVR Atmega644 Development Board *(Self Motivated Project)*   *(August 2012)*
- Made a fully generic Atmega644 development board with following features :
  - Separate ports for SPI/I2C/UART/RS232 interfaces
  - ADC and PWM ports
  - Short circuit detection for protecting external peripherals and sensors

SKILLS

- **Electrical :** Analog, Digital and Power Systems design/interfacing/integration, Microcontroller interfacing (Atmel AVR, Arduino,8051), PCB design, Embedded Protocol (CAN,I2C,SPI,UART).
- **Computers :** Advanced C/C++, SolidWorks, Eagle CAD, LTspice, Sony Vegas.
  Operating Systems : MS Windows, Linux
- **Mechanical :** Metalworking/Machining, Lathe, Welding, Woodworking, fabrication

POSITIONS OF RESPONSIBILITY

- **Organiser at Techfest-2012, IIT Bombay (Asia's largest Science and Technology Festival) :** Organised a Geeky Quiz Competition involving participation from Colleges all over India.
- **Technical mentorship :** Mentoring **60 1st year under-graduates** in Robotic events held **all over India.**
- **Conducted Workshops :** Organised and conducted workshops and sessions on **robotics and embedded systems** in the institute.
- Was the **secretary of Literary Club (2008-09)** in 10th Grade.

AWARDS AND ACHIEVEMENTS

- Awarded the prestigious "**Technical Freshman of the Year (2011-12)" (2 out of 900 1st year students)** by IIT Bombay for *Outstanding performance in Technical Activities during the year 2011-12*
- Got "**Best Student of the Year Award (2008-09)"** in 10th Grade for *all round performance during the year*
- Awarded **State Top 1%** Certificate of Merit in **National Standard Examination in Astronomy (NSEA-2010)**
- Selected for 2nd round of **Kishore Vaigyanik Protsahan Yojana (KVPY-2010-11,** administered by Indian Institute of Science, Bangalore**).**
- Got **All India under 500 rank** in **National Science Olympiad-2008** (9th Grade).
- Achieved **All India Rank 1552** in Joint Entrance Exam (JEE) 2011 conducted by Indian Institute of Technology among 5.5 lakhs students that appeared for the examination
- Awarded **Certificate of Distinguished Performance** with **98.4 percentile** in Maths ASSET Test
- Awarded Certificate of passing **Pratham Sopan Examination** by **"The All India Boy Scout and Guide Association"**

EXTRA-CURRICULAR ACTIVITIES

- Representative of my school in **National Inter School Quiz Competition-2008 (organized by SAIL)** competing with other school teams from all over India.
- **Cultural Activities :**
  - Awarded **Best Singer of the Year (2007-08)** in my school.
  - Got 1st position in **State level Skit competition(2006)** and **qualified for national level.**
  - Know basics of Violin.
- **Social Activities :**
  - Was an active member of **Disaster Management** Team of my school.
  - Went in **flood hit areas** for **cloth and food distribution** with my school team.