Nirav Bhan

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OBJECTIVE

Seeking a summer internship in the period approximately from 1st May to 20th July, 2012

ACADEMIC ACHIEVEMENTS

Achievements :

- CPI (Cumulative Performance Index) of **9.50 on a scale of 10** , after 5 semesters.
- Secured **AA (10/10) grade in all Mathematics courses**. Secured **AP grade**, awarded for outstanding academic performance, in the course Complex Analysis.
- Secured **All India Rank of 98** in IIT-JEE 2009 amongst more than **3,80,000** students
- Secured **All India Rank of 28** in All India Engineering Entrance Examination (AIEEE) 2009 amongst **10,00,000** students
- Received a gold medal in **Indian National Physics Olympiad**, and selected among **Top 37 physics students** of India to be part of the Orientation cum Selection Camp for the International Physics Olympiad(IPhO)
- Cleared the NSEP, NSEC and NSEA exams, standing among **top 350 students in India** in Physics, Chemistry and Astronomy respectively

Scholarships :

- Received the prestigious **KVPY** scholarship from Indian Institute of Science, Bangalore
- Received scholarship in the National Talent Search Examination**(NTSE)** in class 10, **awarded only to top 500 students in India**
- Received scholarships in the Maharashtra Talent Search Examination in class 8 and 9
- Awarded CBSE merit scholarship for excellence in AIEEE

RELEVANT COURSES

Core

- Microprocessors
- Foundations of VLSI CAD
- Digital Systems
- Communication Systems
- Control Systems*
- Digital Signal Processing*
- Digital Communications*
- Analog Circuits
- Power Electronics
- Electrical Network Theory
- Signals and Systems

Non-Core

- Computer Programming
- Data Analysis and Interpretation
- Complex Analysis
- Linear Algebra
- Differential Equations
- Electricity and Magnetism

Minor (Computer Science)

- Data Structures and Algorithms
- Discrete Structures
- Operating Systems

* *These courses shall be completed by 1st May, 2012*

PROJECTS UNDERTAKEN

Term Paper: Binary Knapsack (Nov '11)

Guide: Professor Sachin Patkar, Electrical Engineering Department , IIT Bombay
- Prepared a term paper on the topic "Head-to-head comparison of Greedy vs. Branch and Bound solutions for Binary Knapsack Problem"
- Wrote programs in C++ for solving Binary knapsack problem using Greedy and BnB approach.
- Documented the step-by-step execution tree of the Branch and Bound algorithm.
- Compared the performance of the 2 algorithms on a head-to-head basis using 3 cases of test data.

Pacoblaze Microcontroller (May – Jul '11)

Guide: Professor Sachin Patkar, Electrical Engineering Department , IIT Bombay
- Modified Pacoblaze – a software microcontroller, to do multiplication in 8-bit Galois field
- Thoroughly studied the architecture of the microcontroller and created a new instruction for multiplication
- Modified the Assembler to parse the instruction correctly

GPS Navigator (May – Jul '10)

[Summer Project under Electronics Club]
- Made a device which used co-ordinates from a GPS module and displayed the user's position on a computer screen using a Graphical User Interface
- Programmed a micro-controller(Atmega-16) to store waypoints in EEPROM memory
- **Made a Gui using Qt 4.0** , a free Gui development framework
- Prepared a comprehensive documentation of the project. Details about the project can be found here: **http://stab-iitb.org/blog/?p=109**

Synchronous CDMA [Course Project] (Mar – May '11)

- *Guide: Professor Sachin Patkar, Electrical Engineering Department , IIT Bombay*
- Created a miniature version of synchronous CDMA communication using basic digital components like ICs and logic gates
- Allowed 2 transmitters and 3 receivers to communicate simultaneously over a single data channel

Mini-national UID Project [Course Project] (Jul – Nov '09)

Guide: Professor Deepak B. Phatak , Computer Science Department , IIT Bombay
- Developed a system capable of uniquely identifying an individual on the basis of finger-prints. It can be used for various tasks, like taking attendance
- Was part of the Classification and Consolidation team. Developed a program for processing the finger-print, extracting identifiable characteristics(minutia) from it, and storing them
- Developed an independent algorithm for thinning of the fingerprint

RPM sensor [Course Project]

Guide: Professor Anil Kottantharayil, Electrical Engineering Department, IIT Bombay (Feb '11)
- Made a device to measure the speed of a rotating object, using photo-diodes and LEDs
- Built a signal-processing circuit from simple electronic components, like OPAMP, resistors

INTERESTS

I am very interested in mathematical modelling, simulation, algorithm development. I consider myself as being proficient in analysis.

EXTRA-CURRICULAR ACTIVITIES

Convener of Math and Physics Club, IIT-Bombay, for academic year 2010-2011
- Held various events such as lectures, seminars, competitions, workshops on math and physics
- Introduced physics projects as part of the club activities, for students interested in gaining hands-on experience in physics. **Mentored 4 teams** to successful completion of physics-based projects
- Managed an online group of nearly 400 people. Stimulated discussions on various topics related to Math and Physics

National Service Scheme Volunteer
- Taught science and mathematical subjects to students from relatively poor backgrounds.
- Took part in various activities like group discussions , cloth collection drive , blog-writing, field trip to Kapshi - a model village.

Technical Activities
- **Robocon** : Made a wireless remote controlled robot that could lift blocks and construct a pyramid
- Made a solar-powered boat for Solarsplash event in Techfest. The boat was capable of running on direct and stored solar energy. Received a certificate for successfully completing the track
- Made a C++ program to solve Karnaugh logic maps using self-made heuristic techniques

Quizzes
- Achieved 2nd position in the Annual Physics Bowl (2010) at IIT-Bombay.
- Qualified the preliminary stages of the Indian Puzzle Championship and SciTech Quiz at Techfest 2011. Techfest is Asia's largest Science, Technology and Technical festival

TECHNICAL SKILLS

- Programming Languages - C/C++, Java, Verilog HDL
- Software - Scilab, LTSpice, Matlab, Qt, Eagle, Altera ModelSim, Xilinx ISE Design Suite
- Micro-controllers: Atmel AVR Family, 8051 ;   Microprocessor: 8085

REFERENCE

Professor Sachin Patkar,
Department of Electrical Engineering,
IIT-Bombay, Mumbai
http://www.ee.iitb.ac.in/wiki/faculty/patkar

DECLARATION

I hereby declare that the information given above is true to the best of my knowledge, as of 24th December, 2011

- Nirav Bhan