K Sanath
Electrical Engineering
Indian Institute of Technology Bombay

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B.Tech.
Male
DOB: 20 Oct, 1992

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2013	9.37
Intermediate/+2	Board of Intermediate Education, Andhra Pradesh	Narayana Junior College, Hyderabad	2010	95.70
Matriculation	Board of Secondary Education, Andhra Pradesh	Montessori High School, Kurnool	2008	94.20

CONFERENCE PUBLICATION

- K. Sanath and A. K. Laha, 2013, "Change point distribution in Gamma distributions with economic applications", published in 3rd IIMA International Conference on Advanced Data Analysis, Business Analytics and Intelligence (ICADABAI) held at IIM Ahmedabad on *13th April, 2013*

ACADEMIC ACHIEVEMENTS

- Pursuing Minors in Statistics (Minor CPI of 9.5) and Honors in Electrical Engineering (Honor CPI of 9)
- Ranked 13th in IIT-JEE among over 4.7 lakh students all over India *('10)*
- Ranked 28th in AIEEE among over 10.6 lakh students all over India *('10)*
- Ranked 8th in ISAT, the entrance examination to Indian Institute of Space Technology *('10)*
- Shortlisted by Indian Statistical Institute based on proficiency in Maths along with 112 other students *('10)*
- Awarded the NTSE scholarship by NCERT, given only to the top 1000 students in India *('09)*
- Received Award of Excellence in Australian Chemistry Quiz conducted by The Royal Australian Chemical Institute across 15 countries *('07)*
- Winner of Indian Maths Marathon along with 24 other students all over India *('05)*

INTERNSHIPS AND KEY PROJECTS

- Summer Internship at IBM Research India, Bangalore *(Summer '13)*
  Supply-Demand Problem – Algorithms/Complexity: *Guide:* Sreyash D Kenkre
  - Developed a mathematical model for the Machine scheduling problem (an NP problem) and analyzed it
  - Designed and analyzed scheduling algorithms which have provable guarantees on the performance
  - Obtained constant factor approximate algorithms for supply minimization for a given demand profile
  - Proposed and proved many theoretical properties; reduced many problems to well known NP-Hard problems
  - Used Dynamic Programming to devise algorithmic solutions to the Integer Programming problem
- Summer Internship at IIM, Ahmedabad *(Summer '12)*
  Change point detection in Gamma distribution with economic applications:
  Guide: Prof. Arnab K. Laha, Production and Quantitative methods Department, IIM Ahmedabad
  - Statistically modeled the weekly average of USD v/s Euro exchange rate from January 1995 to July 2012 and Indian annual GDP growth rate since 1960 as a gamma distribution with constant shape parameter
  - Devised and back-tested strategies to detect a shift in the shape parameter of the Gamma distribution
  - Implemented the models and strategies on the given data using R (a statistical programming language)
- Undergraduate Thesis: Analysis of error correcting codes using linear programming *(Autumn '13)*
  Guides: Prof. Vivek Borkar (EE Dept.) and Prof. Ankur Kulkarni (SYSCON Dept.), IIT Bombay
  - Working on improving the bounds on the size of an error correcting code for a specified Hamming distance
  - Modeling an error correcting code as hyper-graph matching problem and hyper-graph transversal problem
  - Using the concepts of linear programming and duality to improve the already available bounds

COURSE PROJECTS

- **Car racing game on FPGA board** *(Spring '12)*
  Guides: Prof. M.B. Patil and Prof. Joseph John, Electrical Engineering Department, IIT Bombay
  - Designed the back-end **logical part** of a 7 lane car racing game using an **FPGA** and a 128x64 LCD display
  - Created multiple levels that have obstacles coming with different speeds and created a scoring system
- **Image processing** *(Spring '12)*
  Guide: Prof. Arjun Arunachalam, Electrical Engineering Department, IIT Bombay
  - Improved corrupted images of an MRI scan of the brain using the concept of Radon transform
  - Performed iterative image reconstruction techniques for image enhancement in MATLAB
- **Dynamic Auctions** *(Spring '13)*
  Guide: Prof. Vivek Borkar, Electrical Engineering Department, IIT Bombay
  - Studying the designing of a simplified dynamic stochastic optimization model for dynamic auctions
  - Two settings of the model are involved: A dynamic population of agents with fixed information and vice versa
- **Monopoly Game in C++** *(Autumn '10)*
  Guide: Prof. D. B. Phatak, Computer Science and Engineering Department, IIT Bombay
  - Developed the **game of Monopoly** based on mouse events and using a GUI in Linux along with 10 other students
  - **Leader** of a group of 4, responsible for coding the backend of the game which included storing and keeping track of players' current location, transactions, net worth, assets etc.,

RELEVANT COURSES

Electrical Courses
- Image Processing
- Control Systems
- Microprocessors
- Network Theory
- Information Theory

Mathematical Courses
- Probability and Random Processes
- Stochastic Optimization
- Statistical Inference
- Differential Equations
- Linear Algebra

Computer Science Courses
- Machine Learning
- Data Structures and Algorithms
- Discrete Structures
- Foundations of VLSI-CAD
- Games and Information

SKILLS

- **Programming Languages** : C/C++, Java, Python, Assembly
- **Application Software** : Eagle, LTspice, Verilog, Labview, Quartus, GNUSim8085
- **Numerical Computing** : R, MATLAB, Scilab

EXTRACURRICULAR ACTIVITIES

- **Convener, The Rubik's Club** *('11-'12)*
  - Was a member of a team of 12, and conducted over 20 beginners' workshops on solving a Rubik's cube
  - Involved in organizing the successful **Guinness record** attempt featuring the participation of **937 students**
- **Technical Mentor:** Guided 4 teams of 4 freshmen each to make their first wired/remote controlled car as part of **TechOne**, the first technological event for freshmen conducted by STAB
- **Coordinator, Techfest:** Led a team of 10 volunteers to conduct 2 lectures of Prof. David Griffiths, an eminent Physicist, as a part of Techfest *'12*
- Winners of "The Beautiful Mind", a **game theory** competition held at *Avenues '12* (annual fest of SJMSOM)
- Winners of Circuit Design Competition organized by Electronics Club, IIT Bombay
- Recipient of **Brown belt in Karate** (Okinawa Karate) and B Certificate in NCC under IIT Bombay Regiment
- **Hobbies and interests:** Table Tennis, Carrom, reading novels and solving puzzles