**Ujjwal Kumar 05002041**

**Electrical Engineering Dual Degree (B.Tech+M.Tech.)**

**Indian Institute of Technology, Bombay Male Specialization: Communication & Signal Processing DOB: 20/11/1986**

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| --- | --- | --- | --- | --- |
| **Examination** | **University** | **Institute** | **Year** | **CPI / %** |
| Graduation | IIT Bombay | IIT Bombay | 2009 | 8.71 |
| Intermediate/+2 | CBSE | St. Michael's High School, Patna | 2004 | 82.40 |
| Matriculation | CBSE | Loyola High School, Patna | 2002 | 93.20 |

**SCHOLASTIC ACHIEVEMENTS**

* Ranked **5th** in my specialization and **9th** amongst 45 students in EE Dual Degree batch (2009)
* **Department rank 1** out of **84** students after 1st year and hence awarded a **branch change** (2006)
* **Fellowship** recipient from Tata Teleservices IITB Centre of Excellence in Telecommunications (2009)
* Council for Scientific and Industrial Research (**CSIR)** “Leadership in Science” awardee (2003)

**OLYMPIADS**

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| * Represented state of Bihar in Indian National Mathematics Olympiad (**INMO**) |  | (2003) |
| * Secured **3rd** rank in state in Regional Mathematics Olympiad (**RMO**) |  | (2002) |
| * Secured **33rd** rank in National Science Olympiad from amongst **25000** students |  | (2002) |
| * Received **merit certificate** in National Mathematics Olympiad, awarded to **top 1%** | **students** | (2001) |

**INTERNSHIPS**

# E.P.F.L. (Swiss Federal Institute of Technology), Switzerland *May-July ‘08*

“Algorithm Development for Computational Systems Biology”

* + - * **Designed an object-oriented toolbox** in MATLAB (partially in C++ using MEX), for dynamical analysis of bio-molecular reaction networks
      * Implemented analysis and simulation algorithms for various **deterministic and stochastic models** of reaction networks, leading to important results in an **award winning publication**
      * **Felicitated** by lab for timely attainment of goals and pleasant and efficient conduct

# TCS Innovation Labs, Mumbai *Dec ‘07*

“Real-time Speaker Identification”

* + - * **Benchmarked** various **identification methods** and suggested use of MFCC’s for speech modeling and 2nd order Gaussian Likelihood Measures for identification
      * Developed an optimized **C++ program** to achieve at least **10-fold improvement in processing time**

**KEY ACADEMIC PROJECTS**

**Joint Data Compression and Security,** *Dual Degree Project Jan ’09-present*

* + - * Carried out an **exhaustive survey** and presented a seminar on existing schemes based on **arithmetic coding** and **wavelet sub-band decomposition**
      * **Classified** the various existing methods in an unified way based on standard parameters
      * **Quantified** the possibility of **adding information** to zero-tree based compression techniques
      * Currently working on quantifying additional choice presented by **hybrid wavelet transforms**

**Image Super Resolution,** *Undergraduate Research Opportunity (UROP), IIT Bombay Jan-May ‘07*

* + - * Explored the possibility of using **Papoulis-Gerchberg** method for image super resolution and method of **Total Variations** for de-noising
      * Implemented it on MATLAB and also did a **comparative study** of various existing techniques

**Digital Cards Game,** *Digital Circuits Course Project Mar-Apr ‘07*

* + - * Successfully completed the given problem of simulating a two player card game on bread boards, using sequential and combinational **logic circuits** over **digital devices**
      * **Further improved** the design to increase user-friendliness and reduce the circuit dimensions

**Dispersion for Graded Index Fiber,** *Fiber Optic Communications Course Project Mar ‘08*

* + - * Calculated **dispersion** for a general graded index fiber, which follows **µ-law variation** in refractive index along the radial direction
      * Used MATLAB GUI to **demonstrate** ray-movement and dispersion values dynamically

**New Routing Protocol on Network Simulator-2,** *Summer Project May-June ‘07*

* + - * Worked on implementation of a new routing protocol on NS-2 using **C++**, after studying various existing

**Link-state routing protocols** such as **OSPF**. **TECHNICAL SKILLS**

* + - * **Languages:** C++, PHP, HTML, 8085/8051 assembly language
      * **Packages:** MATLAB, MS Office, LATEX, Eagle Layout Editor, Keil, Network Simulator-2
      * **Operating Systems:** Windows, Linux

**INITIATIVE**

**Conceptualized, organized** and systematically **executed** an Inter School Quiz Competition (**Brain of Patna**) working with a team of seven IIT students

* + - * Planned a shoe string budget of **Rs. 1.5 lacs** with sponsorship from corporate houses & clubs of Patna
      * Successfully convinced **25 leading schools** of the city attracting a participation of at least **10000 students**
      * Garnered **media attention** through **23 articles** in national dailies and coverage from local channels
      * The event has **grown** into an **annual state level** affair and has been **appreciated** by the **Governor**

**POSITIONS OF RESPONSIBILITY**

**Institute Cultural Web Nominee,** *IIT Bombay Dec ’07-Apr ‘08*

* + - * Created and maintained the institute cultural website and initiated an open discussion forum
      * **Introduced** and **implemented** the idea of making separate websites for various cultural clubs
      * Promoted the website as a reliable and centralized information source of in-campus cultural events

**Senior Student Mentor,** *Department of Electrical Engineering, IIT Bombay Aug ’07-present*

* + - * Part of a 20 member team **selected by faculty**, on the basis of academic performance and sincerity
      * Assisted in identifying underperforming students and acting as a liaison between students and faculty
      * **Responsibl**e for guiding **25 students** in managing their academic and extra-curricular workload

**Teaching Assistant,** *Probability and Random Processes Aug ’09-present*

* + - * Assisting the faculty in a course for **80** students by **conducting tutorials** and grading answer-scripts
      * Conducting sessions outside the classroom for students who are facing difficulties in the course

**EXTRA-CURRICULAR ACTIVITIES WEB**

* + - * Worked with **latest web related technologies** viz. AJAX, JAVASCRIPT, HTML, CSS and PHP and

**Content Management System** such as JOOMLA

* + - * **Voluntarily** developed websites for **Institute Counseling Services** and the campus newsletter **Insight**
      * Used **web server** package XAMPP which includes HTTP server and MYSQL Database

**MISCELLANEOUS**

* + - * Conducted state-level **counseling** and **training workshop** for engineering aspirants (2004, 2005)
      * Member of hostel **hockey** team: Won **bronze** in General Championship, IIT Bombay (2007)
      * Member of **silver** winning team in hostel **football** league. (2008)
      * Attended **French classes** at EPFL and cleared the beginner level with highest marks (2008)
      * Won **1st** prize in district **inter-school science quiz** (2002)