

# Soumya Prasad Ukil

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## Academic

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- **M.Tech.**, CSE – *CGPA: 8.60*  
Indian Institute of Technology Bombay, June 2011 | Web: [www.iitb.ac.in](http://www.iitb.ac.in)
- **B.Tech.**, IT – *CGPA: 8.82*  
Jadavpur University, Kolkata, June 2009 | Web: [www.jadavpur.edu](http://www.jadavpur.edu)
- **Intermediate/10+2**, *Marks: 85.30%*  
Santipur Municipal High School, June 2005
- **Matriculation**, *Marks: 90.23%*  
Santipur Municipal High School, June 2003

## Academic Achievements

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- Ranked 76<sup>th</sup> position in WBBSE in 10<sup>th</sup> standard (approx 5 lacs student) and awarded merit scholarship.
- Ranked 77<sup>th</sup> in GATE (CS) 2009 with 99.81 percentile (approx 43000 students).

## Major Projects

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### **M.Tech. Project: Extending Generic Data Flow Analyzer in GNU C compiler**

*(Master's Thesis, guided by Prof. Uday P Khedker)*

- *Main goal* - To enhance the capability of **gdfa** to support both bit-vector and general data flow framework
- *Major challenge* - To come up with generic lattice-based specification for data flow analysis and machine independent optimizations
- *Studied* rules for lattice constructors and developed **BDD** (Binary decision diagram) based implementation of lattice specification

### **Profile based pointer analysis to perform Partial Redundancy Elimination**

*(Research & Development Project, Guide: Prof. D M Dhamdhere)*

- *Designing* an algorithm to perform Pointer Analysis using profile information.
- The algorithm computes speculative information which is the information along hot paths, and also computes information along cold paths in the program
- All the optimizations are performed using speculative information, and information along cold path is used to provide compensation code if some miss speculation occurs

### **B.E. Project: IP simulation of node addresses in personal area network (ZIGBEE: IEEE 802.15.4)**

*With Prof. Uttam Kumar Roy*

- *Designed* a routing protocol together with addressing scheme for extendable tree topology, based on source routing protocol with minimal overhead
- *Improved* performance in packet delivery with minimal number of hops

## Major Course Project

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### Distributed CEP in Padres, with Prof. Umesh Bellur

- *Implemented* (in Java) a improvement to PADRES middleware for distributed detection of composite subscriptions
- *Extended* the language of composite subscriptions by including support for arbitrarily complex hierarchical queries

### A simple bit-torrent like peer-to-peer application, with Prof. Kameswari Chebrolu

- *Developed* a simple peer-to-peer file sharing application like bit-torrent in C and tested extensively in on several machines

### Implementing SSA E-path PRE in LLVM, with Prof. D M Dhamdhere

- *Implemented* **SSA E-path PRE** based on the algorithm “Eliminatability path-a versatile basis for partial redundancy elimination” by Prof. D M Dhamdhere in LLVM and observed execution time improvement of a program

### Specification of Optimization Transformation in Generic Data Flow Analyzer in GCC, with Prof. Uday P Khedker

- *Designed* specification for optimization transformation using the bit-vector analysis result of **gdfa** on gimple output of **GCC** and developed a parser to transform specification language to GCC source code

### $\lambda$ Scope: Clone of Cscope in Haskell, with prof. Amitabha Sanyal

- *Implemented* interactive, screen-oriented tool to browse through Haskell source files for specified element of code

### Testing of Adhoc On-demand Distant Vector Routing Protocol, with Prof. Aniruddja Sahoo

- *Simulated* **AODV** protocol on an adhoc network consisting of multiple hops using qualnet and compared its performance with **DSR** protocol

## Technical Skills

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- **Key Skills** : Algorithms, Data Structures, Problem Solving
- **Programming Languages** : C, Java, Haskell
- **Open-source software** : GNU complier collection framework
- **Scripting Languages** : Shell script, Python
- **Tools** : Latex, Beamer, ns-2, cscope, ctags
- **Operating System** : Windows, GNU operating system

## Position of Responsibility

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- **Editor** of first reunion magazine “**Illumine 2008**”, dept. of IT, Jadavpur University
- **Assistant Coordinator**: “**Essential Abstraction in GCC(EAGCC) Workshop 2010** ”
- **Main Coordinator**: “**Essential Abstractions in GCC Workshop 2011**”

- Worked as a **Consulting Teaching Assistant** under *Prof. D Phathak* for the course **Computer Programming and Utilization** in Autumn-09.
- Worked as **Teaching Assistant** for the course **Program Analysis** for a batch of 40 students. Responsible for checking assignments and semester exam copies and evaluating the projects of the students.

#### **Extra Curricular Activities**

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- *Played* tabla in various musical functions
- *Played* cricket in school & college
- Other interests: Harmonica, photography

#### **Declaration**

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I do hereby declare that all the information made above is true to the best of my knowledge and belief.

Dated:

**Signature**