NISHCHAY MHATRE

Software Engineer

SKILLS

- **C/C++** 10+ yrs
- **Python** 4+ yrs
- **Linux** 10+ yrs
- **Open Source Tools** 10+ yrs
- **Embedded Systems** 4+ yrs
- **Flask** 4+ yrs
- **GIT** 4+ yrs
- **x86 and ARM Assembly** 2+ yrs
- **R, Scheme** 1 yr

CONTACT

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PROFILE

Software engineer with strong foundations in systems programming, programming languages and mathematics.

Six years of experience in developing simulations, cloud based data science applications, embedded system software and firmware. Worked in diverse verticals such as business analytics, computer vision, chemical reaction analysis, and wearable devices.

Founding member of the COEP Student Satellite Program. Contributed to vital components of the on-board computer for the 'Swayam' satellite, which was launched into space by ISRO in 2016.

Three years of experience in teaching undergraduate computer engineering and conducting faculty development programs.

INDUSTRY EXPERIENCE

Research Associate June 17 - NOW
Oneirix Engineering Laboratories

Oneirix makes simulations, customised engineering software and business analytics tools. My responsibilities have included the implementation of key algorithmic components of these tools and deployment of their production and prototype versions over the cloud. In this capacity I have contributed to projects catering to various business verticals, including:

- Wearable medical devices
- Computational drug discovery
- Smart traffic management
- Retail analytics
- Supply chain optimization

Technologies include:

- Computer vision platforms: OpenCV
- GPU computing: CUDA
- Machine learning frameworks: Keras, Tensorflow, DarkNet
- Server backends: Flask, Apache2, NGINX
- DevOps software: Docker
- Databases: mySQL, MSSQL, mongoDB, Object Relational Models

PUBLICATIONS

A Hybrid Approach to Radiation Fault Tolerance in Small Satellite Applications.

Lead Author
Proceedings of the 62nd International Astronautical Congress, Cape Town, 2011.

Modular Generic Low Cost On Board Computer System for Nano/Pico Satellites

Lead Author
Proceedings of the 62nd International Astronautical Congress, Cape Town, 2011.

Techniques for Benchmarking of CPU Micro-Architecture for Performance Evaluation.

Co-Author
18 th Annual International Conference on High Performance Computing: Student Research Symposium, Bangalore, 2011

Best Student Paper Award

FIRA - A novel method for benchmarking the cache hierarchy.

Co-Author
COMPUTE 2012 : 1 st Annual Conference of ACM Pune Professional Chapter, Pune, 2012

Embedded Systems and Software Engineer May 12 - Dec 13
Freelance

In a freelance capacity, I provided prototyping and product development services for small and medium enterprises. My projects include:

- Software for automatic defect detection in industrial parts using image recognition.
- Cylinder Bore Scanner: A custom made camera which photographs the inner surface of cylindrical machine parts using a linear scanner element.
- Programming and control interface for a bare-metal Fingerprint Scanning Module.
- Signal acquisition, processing and transfer over bluetooth low energy for a wearable pulse waveform monitor.

Technologies include:

- OpenCV,
- ARM assembly language.
- Embedded microcontrollers: AVR, MSP430
- pyGTK

Engineer, Optimisation and Algorithms Division July 11 - April 12
Tata Computational Research Labs

CRL (a subsidiary of Tata Sons Ltd) was responsible for the Eka, India's fastest supercomputer, ranked fourth on the global Top500 list in 2010. The company provided supercomputer based simulation, analytics and big-data processing services to a variety of sectors. My role was to research and develop techniques and algorithms to enhance the computational performance of client applications. In this capacity I contributed to:

- Code analysis and hardware-aware optimisation and tuning of scientific and engineering software.
- Development of efficient and scalable implementations of Graph Traversal Algorithms for huge graphs.
- Developing internal whitepapers on optimisation for the reference of application programmers.

Technologies include:

- x86 Assembly
- FORTRAN
- Intel Performance Tools

Achievements include:

- Analysed, predicted, implemented and delivered a 4x performance gain in the Halliburton Corporation's 3D Finite Difference application. The customer was impressed with CRL's capabilities and this opened the door for more projects from this client as well as the entire oil and gas domain.

TEACHING EXPERIENCE

Adjunct Faculty June 16 - May 17
Abeda Inamdar Senior College

Undergraduate and post-graduate courses :

- C Programming for B.Sc. (CS)
- Operating Systems for M.Sc. (CS)

Assistant Professor Jan 14 - June 16
College of Engineering Pune

Undergraduate and post-graduate courses :

- Fundamentals of Computer Programming
- Operating Systems

ACADEMICS

B. Tech. Information Technology 2007 - 2011
College of Engineering Pune

Graduated with a cumulative GPA of 7.93 on 10 with a 10 on 10 in the final semester.
My B.Tech project, "Techniques for Benchmarking of CPU Microarchitecture", a micro-benchmark suite to analyze CPUs in terms of its micro-architecture won the best project award in the Computing Division at the National Level Jed-I Project Challenge, 2011.
Interning at Tata CRL during my third year of study, I carried out a detailed study of how C and FORTRAN compilers carry out SIMD vectorization of Matrix-Vector and Matrix-Matrix multiplications.
I also served as a volunteer system-administrator for one departmental laboratory and served as student representative on the COEP Academic Senate in 2011. In addition, I was an active member of the collegiate astronomy club, the quiz club and contributed to the annual college magazine.

Software Lead and Project Manager 2008 - 2011
COEP Student Satellite Program

I was part of the team that envisaged and founded the COEP Student Satellite project, on the lines of international CubeSat projects. This effort culminated in the construction of the CoEP Satellite 'Swayam' which was launched by ISRO in June 2016 and successfully completed its mission goals.
I led the student team as Project Manager in 2010-11.
I also headed the On Board Computer Design (2009-10) and wrote some of the key software for the satellite on-board computer, such as the boot-up and memory management code, as well as a minimal real time operating system and the memory error correction.
In recognition of this work I was awarded the Luigi G. Napolitano Award for the Advancement of the Aerospace Sciences by the International Astronautical Federation, October 2011. I became the first Indian national to receive this award.