



# Nishanth Nagendra

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## TECHNICAL SKILLS

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**Programming:** C, C++  
**Platform:** Unix, Linux  
**Programming:** Pthread, Posix Socket API, Debugging tools (gdb, gprof, valgrind, splint),  
**Tools/Libraries** Basic level usage of C++ STL, OpenMP, MPI, FICO Xpress Optimizer library  
**Project Mgmt.:** ViM Editor, GNU Build System (Autotools), Git, Version mgmt. and Defect tracking using IBM's Rationale Software, Basic level usage of Visual Studio / Eclipse IDE s

## PROFESSIONAL EXPERIENCE

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### Research Assistant

**Jul 2014 – Oct 2016**

Chair for Architecture of Parallel and Distributed Systems,  
Technical University of Munich

Munich, Germany

- **InvasIC – Invasive Computing** (<http://invasic.informatik.uni-erlangen.de>)

1. Researched various resource managers for possible candidates to develop support for adaptive parallel applications. This led to extension of an open source, highly scalable resource management and job scheduling system called SLURM by plugins.
2. Developed the support for visualization of runtime scheduling decisions in the Vampir tool with the help of Open Trace Format (OTF) library.
3. Collaborated with research group members developing the invasive version of MPI and resource management to support adaptive MPI applications.
4. *Tech Specs:* C, SLURM, OTF library, Posix library, MPI, MySQL, Perl, gdb, valgrind, Autotools, git, Oracle VM Virtual Box, Vampir

- **AutoTune – Automatic Online Tuning** (<http://www.autotune-project.eu>)

1. Extended the performance capping plugin by implementing and evaluating a simple linear regression technique to model the performance of an OpenMP application for energy efficiency and using the same for making simple predictions using Brent Algorithm.
2. Evaluated the compiler flags selection plugin by testing it against various benchmark scientific applications for precision, robustness and performance.
3. *Tech Specs:* C++, Periscope Tuning Framework, OpenMP, gdb, valgrind, git, Autotools

### Senior R&D Engineer

**Aug 2011 – Sep 2013**

Mavenir Systems (now Mitel)

Bangalore, India

- Low level design, and, Implementation of new features in the AirMessenger messaging product.
- Involved in the enhancement of several modules relating to SMPP, billing, LDAP, traffic logging, message receiver/delivery, message store, queuing, retrieval and retrying functionalities.
- Testing, Documentation and Product support for bug fixes after live deployment.
- *Tech Specs:* C, MAP, SMPP, DCCA, Wireshark, gdb, Postgres, ClearCase, ClearQuest

- Implemented the support for migration of a VoIP product (Sonus ASX) from IPv4 to IPv6. This involved low level design, and, enhancement of protocol specific modules like SIP, DIAMETER etc. along with unit, functional and system testing using scripts and softphones.
- Underwent training for 2 months on UMTS technology, product based training on RNC, Uplane software. Performed sustenance, feature enhancement and resolved small bugs.
- Simulation of X2AP – an LTE specification [at Aricent Training Facility]. A short team project which involved programming with sockets, threads, Unix IPC facilities like message queues, and, pipes.
- *Tech Specs: C, C++, TCP / IP Socket Programming, SIP, Diameter, Wireshark, gdb, valgrind, gcov, splint, ClearCase, ClearQuest, CVS*

## EDUCATION

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### **Master of Science in Informatics**

**Munich, Germany***Technical University of Munich, Oct 2013 – Jul 2016**GPA: 1.3 / 5.0 (1.0 – Best, 5.0 - Worst)*

### **Bachelor of Computer Science and Engineering**

**Bangalore, India***Atria Institute of Technology, 2005 – 2009 (GPA: 79.50 / 100)*

*Thesis Topic : Implementation of an Image Editing Software and A JPEG  
Compression Utility with the help of Matlab*

## ACADEMIC RESEARCH PROJECTS

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### **Master Thesis: Job Scheduling for Adaptive Applications on**

**Nov 2015 – Jul 2016**

#### **Future HPC Systems (Team Size: 1)**

Research, development and evaluation of a dynamic and flexible scheduling strategy for adaptive parallel applications. This approach is based on a new negotiation protocol between batch and runtime schedulers and their new algorithms respectively. The framework has been developed in SLURM.

### **A Protocol for Integration of Invasive Resource**

**Apr 2015 – Oct 2015**

#### **Management into Existing Batch Systems (Team Size: 1)**

Research and development of a new negotiation protocol similar to the ones used in resource management systems for Cloud. Developed the protocol communication infrastructure, a new plugin in SLURM along with a dummy runtime scheduler to simulate the negotiation protocol.

### **Implementation of a Metaheuristic for the Discrete**

**Dec 2014 – Nov 2015**

#### **Network Design Problem (Team Size: 1)**

Researched various metaheuristic approaches to solve traffic network design problems. Implemented a Genetic Algorithm in C along with the Modeling and Solving of the optimization problem using FICO Xpress Optimizer library in C++. Evaluated the algorithm under various settings with small to large scale traffic networks for correctness, performance and effectiveness.

### **Parallelization of Applications using OpenMP and MPI (Team Size: 3)**

**Apr 2014 – Aug 2014**

Parallelization of the given heat simulation code in C using OpenMP. Parallelization of the minimax and alpha-beta search techniques in the given two player game (C++) called "Abalone" using MPI.

## PERSONAL SKILLS

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*Organizational Skills:* Experience working in small / large software development teams both in a flat and vertical hierarchy. Strong experience of the full software development lifecycle.

*Language Skills:* Proficient - Kannada, English and Hindi. Basic – German, Sanskrit

*Hobbies and Interests:* Dancing, Cooking, Biking, Playing Violin

## REFERENCES

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**Prof. Dr. Michael Gerndt**

*Professor, Technical University of Munich*

*Chair for Architecture of Parallel and Distributed Systems*

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<http://wwwi10.lrr.in.tum.de/~gerndt/home/index.html>