

# FEROSH JACOB

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## AREAS OF EXPERTISE

Software Application Development/Testing, Systems, High Performance Computing, C/C++, Python, Bash.

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## TECHNICAL SKILLS

- **Programming Languages and Technologies**  
Bash (write), C/C++ (write), Fortran (read), Java (write), Javascript (write), Python (write)
- **Parallel/Distributed Systems**  
CUDA, Hadoop, MPI, OpenCL, OpenMP
- **Machine Learning Tools and Algorithms**  
SRILM, LDA, KNN, SVM
- **Web Tools**  
CXF, HTML, J2EE, JSON, Orbeon, PHP, Tomcat
- **Database Technologies**  
MySQL, Oracle, PostgreSQL, XMLDB
- **Language Tools**  
ANTLR, EMF, GMF, Meta-Programming, Modeling, Xtext, Xtend
- **Other Tools and Frameworks**  
CVS, Eclipse, Hibernate, JBPM, JUnit, Mule, StringTemplate, SVN, Taverna, VSS, L<sup>A</sup>T<sub>E</sub>X

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## EDUCATION

- **Doctor of Philosophy** 2009-2013  
Department of Computer Science, The University of Alabama, Tuscaloosa, AL  
Advisor: Dr. Jeff Gray  
Thesis: *Modeling of High Performance Programs to Support Heterogeneous Computing*
- **Master of Science** 2007-2009  
Department of Computer Science, Clarkson University, Potsdam, NY  
Advisor: Dr. Daqing Hou  
Thesis: *CSeR - A Code Editor for Tracking & Visualizing Detailed Clone Differences*
- **Bachelor of Technology** 2000-2004  
Department of Electronics and Communication, National Institute of Technology, Calicut, India

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## PROFESSIONAL EXPERIENCE

- **Research Position** June 2010 - present  
Department of Computer Science, The University of Alabama, Tuscaloosa, AL
  - Identified, analyzed, and developed four modeling approaches (Code-level, Algorithm-level, Program-level, and Domain-level) for HPC problems to leverage portability, improved source code maintenance, and heterogeneous computing.
  - Worked on design, development, and testing stages of four projects based on Model-Driven Engineering techniques:
    - \* PPMModel (Java, ANTLR, C/C++),
    - \* MapRedoop (Hadoop, EC2),
    - \* WDL & SDL (J2EE, CXF Web services, Mule), and
    - \* PNBsolver (C/C++, Java, Xtext).
  - Collaborated with many researchers and scientists in the field of model-driven engineering, mathematics, and cloud-computing.

## PROFESSIONAL EXPERIENCE (CONTINUED)

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- **Ph.D. Intern** *May 2012 - Aug 2012*  
Pacific Northwest National Laboratory, Richland, WA
  - Developed two Domain-Specific Languages (DSLs) for scientists to describe and deploy signature discovery workflows. The Service Description Language (SDL) describes key elements of a signature discovery service and automatically generates its implementation code. The Workflow Description Language (WDL) describes the pipeline of services and generates deployable artifacts for the Taverna workflow management system.
  - Code generated is currently used in two projects: 1) SignatureAnalysis and 2) SignatureQuality
- **On Campus Ambassador** *Oct 2007 - May 2008*  
Sun MicroSystems, Clarkson University, Potsdam, NY
  - Duties included creating and supporting user groups and conducting seminars about the latest tools and technological advances.
- **Software Engineer** *Jun 2004 - Jul 2007*  
Stabilix Private Solutions Ltd, Trivandrum, India
  - Worked in the security module of FELIX project, a generic application/claim processing tool for insurance companies.
  - Implemented the business model using a generic workflow engine.
  - Served as a middle layer programmer, providing interfaces for database connectivity to other layers.
  - Designed and implemented several dynamic web user interfaces with many smart widgets and controls.

## ACHIEVEMENTS

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- **Second place** *2011*  
*ACM Mid-Southeast Conference*  
Student Paper Competition, Gatlingburg, TN
- **ACM Outstanding Graduate Student** *2011*  
*The University of Alabama*  
Computer Science for Honors Day, AL
- **Best Presentation Award** *2010*  
*International Conference on High Performance Computing (HiPC)*  
Student Research Symposium, India
- **Bronze Medal** *2010*  
*Annual Conference on Systems, Programming and Applications: Software for Humanity (SPLASH)*,  
Student Research Competition, Reno, NV
- *Upsilon Pi Epsilon*, Computer Science Honor Society
- IEEE and ACM student member

## SELECTED PUBLICATIONS

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- **Ferosh Jacob**, Amber Wagner, Prateek Bahri, Susan Vrbsky, and Jeff Gray, “Simplifying the Development and Deployment of MapReduce Algorithms,” *International Journal of Next-Generation Computing* (Special Issue on Cloud Computing – Yugyung Lee and Praveen Rao, eds.), vol. 2, no. 2, 2011, pp. 123-142.
- **Ferosh Jacob**, Jeff Gray, Jeffrey Carver, Marjan Mernik, and Purushotham Bangalore, “PPModel: A Modeling Tool for Source Code Maintenance and Optimization of Parallel Programs,” *The Journal of Supercomputing*, vol. 62, no 3, 2012, pp. 1560-1582.
- Weihua Geng and **Ferosh Jacob**, “A GPU Accelerated Direct-Sum Boundary Integral Poisson-Boltzmann Solver,” *Computer Physics Communications*, 14 pages (accepted for publication on January 2013).
- **Ferosh Jacob**, David Whittaker, Sagar Thapaliya, Purushotham Bangalore, Marjan Mernik, and Jeff Gray, “CUDAACL: A Tool for CUDA and OpenCL Programmers,” in *Proceedings of the 17th International Conference on High Performance Computing*, Goa, India, December 2010, pp. 1-11.
- **Ferosh Jacob**, Daqing Hou, and Patricia Jablonski, “Actively Comparing Clones Inside the Code Editor,” in *Proceedings of the 4th International Workshop on Software Clones*, Cape Town, South Africa, May 2010, pp. 9-16.