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Prathmesh Prabhu

Academic Qualifications

- Expected Dec 2012 **MS, Computer Sciences, University of Wisconsin-Madison.**
GPA: 3.90/4.00
- 2010 **Bachelor of Technology, Indian Institute of Technology, Bombay.**
CPI: 9.48/10.00 (ranked second in the department)

Work Experience

- Jun 12 – Aug 12 **Research Intern, Microsoft Research India, Bangalore.**
Interned with the Rigorous Software Engineering group, working to improve the scalability of *Corral* model checker for concurrent imperative programs. Conceptualized a notion of procedure summaries for concurrent programs. Implemented a light-weight tool to find procedure summaries that speeds up the search for bugs in Corral.
- Sep 11–present **Research Assistant, University of Wisconsin-Madison.**
Worked with Prof. Thomas Reps in the Computer Sciences department on concurrent program verification and methods to speed up program analysis tools. Contributed to the open-source WALi Push-Down System library maintained in the verification group at Wisconsin. I own and currently maintain a part of the library.
- May 09–Jul 09 **Software Development Engineer, Intern, Microsoft India Development Center, Hyderabad.**
Conceptualized a product on the *Live Mesh* framework for a mobile application to enable location-based information sharing. Implemented a proof of concept application for Windows Mobile.

Designed an opaque session transfer tool that monitors process activity during a user session on Windows and mirrors minimal changes from the session to provide a seamless experience across sessions.
- May 08–Jul 08 **Engineering Intern, BitMapper Integration Technologies Pvt. Ltd., Pune.**
Developed firmware to process incoming GPS data for a satellite downlink, and participated in the final test and demonstration to the National Remote Sensing Agency, India.

Developed a system to handle real-time data from an in-flight missile using the *PicoBlaze* soft core.

Projects and Seminars

- Spring 2011 **Newton's method on ω -continuous semirings for Affine Relations Analysis.**
Implemented a fix-point solver based on an extension of Newton's method. Studied performance comparison of the solver with more traditional solvers for computing Affine Relations on x86 executables to find that Newton's method is slower in real world applications, contrary to expectations from prior work. My recent work has concentrated on bridging this theory-practice gap.
- Summer 2011 **Participated in the First Summer School on Formal Techniques, Menlo College, Atherton.**
Included exposure to, and hands-on experience with, industry standard verification engines like PVS, Coq, and Yices, and their applications in the hardware industry
- Fall 2010 **GutenTag.**
In a team of 10 students, developed an open-source tool for IIT's e-outreach program to help content generation for online courses. Like Microsoft Producer, this firefox plugin enabled syncing of lecture data in the form of various media, including images, notes, lecture videos etc, that would then be published as a finished lecture to be posted online.
- Fall 2008 **Verification of Concurrent Software, B. Tech Seminar.**
Studied foundational work on concurrent software verification; focussed on recent advances in type-checking and model checking approaches with domain-specific solutions to hard problems.

- Fall 2008 **Annual cultural calendar management and archiving system (SemsSnap).**
Designed and implemented a web portal for the IITB gymkhana cultural team facilitating event management. The goal was to provide students a common portal for event scheduling and management, and generate an official record of their cultural activities during their course of study.
- Fall 2007 **Simulation of Computer Hardware (SOCH).**
Implemented a Java Applet that enables students to configure and piece together a simplified Von-Neumann machine and simulate program execution on the machine. This applet was used as a prototype by IIT's e-outreach program to develop a learning tool.

Publications

- Gember A., Prabhu P., Ghadiyali Z. and Akella A.. Towards software-defined middlebox networking. In *Hot Topics in Networks (HotNets)*, 2012.
- Prabhu P., Lal A., Kidd N. and Reps T., Verifying concurrent programs via bounded context-switching and induction. Technical Report TR-1702, *Computer Sciences department, University of Wisconsin-Madison*, November 2011
- Equilibrium concepts in graph games. Bachelor's Thesis, Indian Institute of Technology, Bombay, 2010

Academic Honours and Other Significant Awards

- Awarded a **Stephen Kleene Fellowship** (2010) towards the first year of graduate study by the Computer and Information Sciences department at University of Wisconsin-Madison.
- Secured **all India rank 14** in the Joint Entrance Exam, 2006 held for entrance to the Indian Institute of Technology.
- Won **gold medal** at the 38th International Chemistry Olympiad, Republic of Korea. Also awarded special mention for "best in theoretical chemistry" at the national selection camp for the Olympiad.
- Recipient of the 2007 **O. P. Jindal Engineering and Management Scholars (OPJEMS)** scholarship award (one among 99 students awarded from India).
- Recipient of the **NTS Scholarship** awarded by the Government of India 2004-2009.
- Awarded **silver medal** in the All India AECS Junior Science Olympiad, 2003, organized by the Atomic Energy Education Society, Bombay.

Related Courses

Besides the undergraduate computer science courses, I have taken graduate level courses in the following areas.

- Programming languages and compilers
- Analysis of software artefacts
- Advanced computer networks
- Analysis of large sparse systems
- Principles of programming languages
- Tools and environments for optimization
- Computational photography
- Program (dataflow) analyses

Skills

Languages C++, C#, Java, OCaml, MATLAB and Boogie

Tools Worked on compiler frameworks LLVM and GCC, and various model checking frameworks like WALi, Boogie, Moped, TVLA etc; used theorem prover Z3, optimization framework GAMS.

Other Interests

Outdoor Activities I completed a Basic Mountaineering Course from a government institute (ABVP) at Manali, India in 2010. I have actively pursued canoeing, kayaking and backpacking in Wisconsin.

In the classroom In Spring 2012, I volunteered to tutor physics with a university tutoring service. Currently, as a part of a service learning course, I'm leading an after-school club for 4th and 5th graders, teaching them the graphical language *Scratch*. I am also learning the classical Sanskrit language at UW-Madison.