Suriya Subramanian

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http://suriya.github.io

Current Position

Founder at CloudZen Software Labs (since June 2015)

CloudZen Software Labs is a newly bootstrapped startup that provides data analytics solutions to Engineering, Procurement, and Construction (EPC) companies. These companies handle very complex projects with several people in multiple departments keeping track of various pieces of information. CloudZen provides a cloud-based service to manage all of this complexity and optimize project execution in terms of time and money.

Previous Position

Researcher at IBM Research (March 2013 - May 2015)

My primary focus was on building data management infrastucture to handle and derive insights from a high volume of Information Technology data. Our solution to index temporally evolving data was published at CIKM 2015. Some of our novel algorithms to issue alerts at scale based on log data and machine state data are pending patent approval.

Education

PhD in Computer Sciences **August '03 - May '10**
Thesis: Dynamic Software Updates: A VM-Centric Approach
Advisor: Prof. Kathryn S. McKinley
Department of Computer Science
The University of Texas at Austin

Master of Science in Computer Sciences **August '03 - May '06**
Department of Computer Science
The University of Texas at Austin

Bachelor of Engineering in Computer Sciences **August '99 - May '03**
Anna University
College of Engineering, Guindy, Chennai, India

Experience

Binary Translation Software Engineer **Jun '10 - Feb '13**
At Intel Corporation, Santa Clara, CA. Responsibilities include designing and implementing compilers, static analysis, formal verification, and designing and implementing test frameworks.

As part of a two member team, I started prototyping a Binary Translator (BT). I developed most parts of the BT analyzer and the entire backend code generator, and various debugging and validation tools. Following our achieving good results, our organization invested more resources in our project, and I helped ramp up engineers newly joining our team. We now have about 30 people working on our project and our Binary Translator is on track to become an Intel product.

We implemented the BT in C. I wrote most parts of the BT analysis and BT code generator. The entire code generator logic is contained in various code sequence templates. These templates also take into account microarchitectural performance constraints to decide what sequence to generate. When building the BT, we take all these template sequences and produce the BT code generator's C code. I wrote this entire framework in Python. As a by product, this Python framework also generates numerous testcases for the BT code generator.

Graduate Research Assistant **Jan '07 - May '10**
Graduate Research Assistant with Dr. Kathryn McKinley. Worked on supporting Dynamic Software Updates in Java.

Teaching Assistant **Aug '07 - Dec '07**
Teaching Assistant for "Advanced Compiler Techniques," instructor Dr. Keshav Pingali, (Fall 2007), Department of Computer Science, The University of Texas at Austin. Responsibilities included holding office hours, conducting tutorial sessions, designing and grading assignments. The Department of Computer Science awarded me a **TA Excellence Award - Honorable Mention**.

Graduate Intern **May '06 - Aug '06**
Internship in the ICC Compiler group at Intel, Santa Clara. Mentor: David Sehr. I worked on "Threading support by compiler instrumentation." I added a compiler phase to ICC to statically instrument memory instructions. These instrumented instructions make calls to a runtime system, that helps detect dependences that inhibit parallelism. To demonstrate the utility of this approach, we worked on instrumenting and parallelizing ICC.

Graduate Research Assistant **May '04 - December '06**
Member of the TRIPS compiler team. Worked on array layout and loop reordering optimizations in the Scale compiler for improving memory accesses to the banked L-1 data cache in the TRIPS processor. I also worked on profiling of memory accesses, and feeding this data back to the TRIPS scheduler, to help place memory operations on the grid in an efficient manner. During this time, I also implemented the PowerPC/Linux backend for the Scale compiler.

Teaching Assistant **Jan '05 - May '05**
Teaching Assistant for "Introduction to Operating Systems (Honors)," instructor Dr. Mike Dahlin (Spring 2005), Department of Computer Science, The University of Texas at Austin. Responsibilities included holding office hours and grading programming assignments.

Teaching Assistant **Aug '04 - Dec '04**
Teaching Assistant for "Graduate Compilers," instructor Dr. Kathryn McKinley, (Fall 2004), Department of Computer Science, The University of Texas at Austin. Responsibilities included holding office hours, grading homeworks, setting up infrastructure, preparing programming assignments and automated testing of assignments.

Patents

Abhay S. Kanhere, Saurabh Shukla, **Suriya Subramanian**, Paul Caprioli: "State recovery methods and apparatus for computing platforms," US Patent 9032381
`https://www.google.com/patents/US9032381`

Conference Publications

Animesh Nandi, **Suriya Subramanian**, Sriram Lakshminarasimhan, Prasad Deshpande, Sriram Raghavan: "Lifespan-Based Partitioning of Index Structures for Time-Travel Text Search," In 24th ACM International Conference on Information and Knowledge Management (CIKM), 2015 (21% acceptance rate).

Stephen Magill, Michael Hicks, **Suriya Subramanian**, Kathryn S. McKinley: "Automating Object Transformations for Dynamic Software Updating," In Object-oriented Programming, Systems, Languages, and Applications (OOPSLA), 2012 (25% acceptance rate).

Suriya Subramanian, Michael Hicks, Kathryn S. McKinley: "Dynamic Software Updates: A VM-centric Approach," In Programming Language Design and Implementation (PLDI), 2009 (20% acceptance rate).

Suriya Subramanian, Kathryn S. McKinley: "HeDGE: Hybrid Dataflow Graph Execution in the Issue logic," The 4th International Conference on High Performance and Embedded Architectures and Compilers (HiPEAC), 2009 (28% acceptance rate).

Mohan G Kabadi, Natarajan Kannan, Palanidaran Chidambaram, **Suriya Subramanian**, and Ranjani Parthasarathi: "Dead-Block Elimination in Cache: A Mechanism to Reduce I-Cache Power Consumption in High Performance Microprocessors," 9th International Conference on High Performance Computing (HiPC), pages 79-88, 2002 (39% acceptance rate).

Awards

TA Excellence Award - Honorable Mention, Department of Computer Science, UT (Fall 2007)
Dean's Excellence Award from the College of Natural Sciences, UT (2003)
Microelectronics and Computer Development Fellowship, UT (2003-2004)
NCERT National Talent Search Scheme Scholarship, India (1997-2003)
Dr. MGR Quiad-e-milleth Endowment Scholarship, Anna University (1999-2003)

Talks

"Time-travel Text Search"

- Keynote talk at International Conference on Intelligent Information Technologies 2014, Anna University, Chennai

"Dynamic Software Updates: A VM-centric Approach"

- ACM SIGPLAN 2009 Conference on Programming Language Design and Implementation (PLDI), Trinity College, Dublin, 2009/6/16
- DaCapo Research Meeting, Tufts University, Boston, 2009/5/1
- Programming Lunch series, The University of Texas at Austin, 2009/4/24
- Parasol Seminar, Texas A&M University, 2009/4/17
- DaCapo Research Meeting, University of Massachusetts Amherst, 2008/1/3
- Programming Lunch series, The University of Texas at Austin, 2007/12/12

"HeDGE: Hybrid Dataflow Graph Execution in the Issue logic"

- The 4th International Conference on High Performance and Embedded Architectures and Compilers (HiPEAC 2009), Paphos, Cyprus, 2009/1/28
- 8th Annual Austin CAS Conference, IBM Campus, Austin, TX, 2007/3/2

"Compiler Controlled Speculation for Power Aware ILP Extraction in Dataflow Architectures"

- Talk on behalf of Muhammad Umar Farooq at the 4th International Conference on High Performance and Embedded Architectures and Compilers (HiPEAC 2009), Paphos, Cyprus, 2009/1/28

Other activities

Action Center Co-ordinator (2007, 2008), Vibha Austin, a non-profit focussing on underprivileged children

Mridangam (South Indian Classical Drum) artist with concert performances in India and the United States