Gowtham Kaki
http://gowthamk.github.io gkaki@purdue.edu (201) 417 1775

Interests Program Logics, Type Systems and Static Analyses.

Education

Ph.D., Computer Science. 2012 - present
Advised by Prof. Suresh Jagannathan.
Purdue University, West Lafayette, IN.
Current GPA: 3.64/4.0

B.E.(Hons)., Computer Science. July, 2009
BITS, Pilani, India.
GPA: 8.68/10.0

Research

Declarative Programming over Eventually Consistent Data Stores
(With Sivaramakrishnan KC., and Suresh Jagannathan) Devised a logic-based language framework to express high-level consistency requirements of NoSQL applications. The framework delivers application programmers from having to manually tune consistency levels of NoSQL stores, such as Cassandra, which are often tied to the implementation nuances of these stores. Further, the framework comes with an extensive support for scalable transactions, which is needed to build real-world NoSQL applications. The implementation of the framework (called QUELEA) is available online at `https://github.com/kayceesrk/Quelea`.

- Submitted to ACM SIGPLAN Conference on Programming Languages Design and Implementation (PLDI), 2015. Draft paper avalilable at `http://gowthamk.github.io/docs/quelea.pdf`.

Relational Framework for Higher-order Shape Analysis
(With Suresh Jagannathan) Devised a specification language based on a decidable relational logic to automatically reason about structural properties in ML-like languages. Our specification language makes it possible to capture rich semantics of data structure transformations as logical formulas, and subsequently use them for either verification or proving program equivalence. The verification framework for our language (called CATALYST) has been implemented, and is available for experimentation at `http://tycon.github.io/catalyst/`.

- Published in the proceedings of the International Conference on Functional Programming (ICFP), Gothenburg, 1st-6th September, 2014.
- Presented at the Higher-Order Program Analysis (HOPA) Workshop, New Orleans, 28th-29th June, 2013.
- Presented at the Mid-west Verification Day (MVD), Chicago, 20th-21st September, 2013.
- Ongoing work on extending the framework with specification inference is presented at the Mid-west Verification Day (MVD), Columbia, MO, 2nd-3rd October, 2014.

A Novel Adaptive Scheduling Algorithm for Computational Grids
(With S. Bansal, and Chittaranjan Hota) Devised a de-centralized dynamic load balancing algorithm for efficient task scheduling in computational grids.

- Published in the proceedings of IEEE conference on Internet Multimedia Systems Architecture and Applications (IMSAA), Bangalore, India, 2009.

Professional Experience

Research Intern, Microsoft Research India, Bangalore May - August, 2014
(With G Ramalingam, K Vaswani, and D Vytiniotis) Built a region type system for Microsoft Dryad programs to ensure memory safety in presence of programmer-managed memory regions. Also developed a type inference algorithm that will automatically infer region types even in presence of higher-order functions. A paper describing the type system will be available from April, 2015.

Software Engineer, Yahoo SDC, Bangalore, India August, 2009 - July, 2011
Frontend engineering for Yahoo content platforms group. Developed AJAX and php tools for querying, processing and presenting loosely-structured data from various content grids inside yahoo. The tools were used by Yahoo's content curators.

Engineering intern, Qualcomm, Hyderabad, India January - June, 2009
QA Engineering for Application-specific integrated circuit (ASIC) - User interface module (UIM) group. Developed tools to test low-level mobile network code.

Academics

Relevant Graduate Coursework (With Grades)

- Programming Languages (A), Software Engineering (B), Metaprogramming and Program Generation (A+), Distributed Systems (A), Parallel Computing (A), and Current topics in Theoretical Computer Science (A-).
- Attended Oregon Programming Languages Summer School (OPLSS'13) at Eugene, OR.

Courses Handled as a Teaching Assistant

- CS240 C Programming. Fall 2012.
- CS565 Programming Languages. Spring, 2013.

Grants and Scholarships

- Received ACM SIGPLAN PAC travel grant for ICFP 2014.
- Received ACM SIGPLAN PLMW scholarship for POPL 2014.
- Received institute merit-cum-need scholarship during all semesters of my undergraduate education at BITS, Pilani, India.

Professional Service

- Coordinating weekly sessions of Purdue PL (PurPL) reading group. Notes/Slides for some sessions when I led the discussion are available on my web page.
- Purdue CS Graduate Student Board (GSB) office member, Fall 2011 and Spring 2012.
- Secretary (junior year), and office member (freshman and sophomore years) of Computer Science Association (CSA) BITS, Pilani. We organized our techfest (APOGEE) in 2008.

References

Prof. Suresh Jagannathan (Purdue University).
Dr. Ganesan Ramalingam (Microsoft Research).
Other references will be available on request.