

Curriculum Vitae

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KC Sivaramakrishnan

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❖ Summary

I am interested in the design and implementation of concurrent programming languages targeting scalable platforms such as many-core processors and compute clouds. My research spans programming models, compilers, static analysis, schedulers, threading systems, and memory management.

❖ Education

PhD — Computer Science

Thesis Title: **Functional Programming Abstractions for Weakly Consistent Systems**

Advisor: Suresh Jagannathan

May 2011 – Dec 2014

Purdue University, USA

Master of Science — Computer Science

GPA: 3.94/4

Aug 2008 – May 2011

Purdue University, USA

Bachelor of Engineering — Computer Science and Engineering

GPA: 9.55/10

Aug 2004 – May 2008

PSG College of Technology

Anna University, India

❖ Experience

Research Associate, University of Cambridge

Advisor: Anil Madhavapeddy

Dec 2014 – present

Cambridge, UK

Developing **Multicore OCaml** under the OCaml Labs initiative in the Computer Laboratory.

Research Assistant, Purdue University

Advisor: Suresh Jagannathan

Aug 2008 – Dec 2014

West Lafayette, IN, USA

My research focused on discovering new language abstractions and developing runtime system techniques to ease programming weakly consistent systems. To this end, I have built **MultiMLton**, a parallel and distributed extension of MLton Standard ML compiler and runtime and **Quelea**, a shallow extension of Haskell for declarative programming over eventually consistent data stores.

Teaching Assistant, Purdue University

Undergraduate C Programming (CS180)

Graduate Programming Languages (CS565)

West Lafayette, IN, USA

Aug 2012 – Dec 2012

Aug 2011 – Dec 2011

My tasks included designing and evaluating weekly projects, office hours for one-on-one instruction, and grading.

Research Intern, Microsoft Research, Cambridge

Advisors: Tim Harris, Simon Marlow, and Simon Peyton Jones

Feb 2012 – May 2012

Cambridge, UK

I developed a concurrency substrate for Glasgow Haskell Compiler (GHC) to allow programmers to modularly implement user-level schedulers and concurrency libraries for Haskell threads in Haskell, without having to re-engineer critical runtime system components. The concurrency substrate is built around one-shot continuations and uses transactional memory for coordination.

Research Intern, Samsung Information Systems America (R&D)

Advisor: Daniel Waddington

May 2010 – Aug 2010

San Jose, CA, USA

I was part of the core team that developed SNAPPLE programming language – a safe and concurrent extension of C++ targeted at many-core processors. The task involved designing language extensions for concurrency, compiler extensions for safety, and a runtime for executing large number of lightweight threads. SNAPPLE was implemented as a veneer on top of C++ using LLNL Rose source-to-source compiler.

As a part of the Compiler Engineering group, I ported Kaffe, an open source Java VM to an embedded microprocessor ANUPAMA and a desktop processor ABACUS. Developed a lightweight threading subsystem, and implemented a JIT backed for ABACUS.

❖ Journal Publications

- J2 **MultiMLton: A Multicore-aware Runtime for Standard ML** Nov 2014
KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
Journal of Functional Programming (JFP), 24(6): 613 – 674
- J1 **Efficient Sessions** Feb 2013
KC Sivaramakrishnan, Mohammad Qudeisat, Lukasz Ziarek, Karthik Nagaraj, Patrick Eugster
Science of Computer Programming (SCP), 78(2): 147 – 167
Invited paper

❖ Conference Publications

- C7 **Declarative Programming over Eventually Consistent Data Stores** Jun 2015
KC Sivaramakrishnan, Gowtham Kaki, Suresh Jagannathan
International Conference on Programming Language Design and Implementation (PLDI)
- C6 **Rx-CML: A Prescription for Safely Relaxing Synchrony** Jan 2014
KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
Symposium on Practical Aspects of Declarative Languages (PADL)
- C5 **A Coherent and Managed Runtime for ML on the SCC** Nov 2012
KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
Many-core Architecture Research Community Symposium (MARCS)
Best paper award
- C4 **Eliminating Read Barriers through Procrastination and Cleanliness** Jun 2012
KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
International Symposium on Memory Management (ISMM)
- C3 **Composable Asynchronous Events** Jun 2011
Lukasz Ziarek, KC Sivaramakrishnan, Suresh Jagannathan
International Conference on Programming Language Design and Implementation (PLDI)
- C2 **Efficient Session Type Guided Distributed Interaction** June 2010
KC Sivaramakrishnan, Karthik Nagaraj, Lukasz Ziarek, Patrick Eugster
International Conference on Coordination Models and Languages (COORDINATION)
- C1 **Partial Memoization of Concurrency and Communication** Sep 2009
Lukasz Ziarek, KC Sivaramakrishnan, Suresh Jagannathan
International Conference on Functional Programming (ICFP)

❖ Workshop Publications

- W4 **Migrating MultiMLton to the Cloud** Sep 2013
KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
ML Workshop
- W3 **Scalable Lightweight Task Management Schemes for MIMD Processors** Apr 2011
Daniel G. Waddington, Chen Tian, KC Sivaramakrishnan
Workshop on Systems for Future Multi-Core Architectures (SFMA)

W2 **The Design Rationale for MultiMLton** Sep 2010
Suresh Jagannathan, Armand Navabi, KC Sivaramakrishnan, Lukasz Ziarek
ML Workshop

W1 **Lightweight Asynchrony using Parasitic Threads** Jan 2010
KC Sivaramakrishnan, Lukasz Ziarek, Raghavendra Prasad, Suresh Jagannathan
Workshop on Declarative Aspects of Multicore Programming (DAMP)

❖ Technical Reports and Drafts

T2 **Composable Scheduler Activations for Haskell** Dec 2014
KC Sivaramakrishnan, Tim Harris, Simon Marlow, Simon Peyton Jones
Under consideration for Journal of Functional Programming (JFP)

T1 **Featherweight Threads for Communication** Nov 2011
KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
Purdue University Computer Science Technical Report – TR-11-018

❖ Talks

Functional Programming Abstractions for Weakly Consistent Systems Dec 2014
PhD Defense Purdue University

Functional Abstractions for Practical and Scalable Concurrent Programming Mar 2014
Invited Lecture Microsoft Research, Cambridge, UK

Rx-CML: A Prescription for Safely Relaxing Synchrony Jan 2014
PADL 2014 San Diego, CA

Migrating MultiMLton to the Cloud Sep 2013
ML Workshop 2013 Boston, MA

A Coherent and Managed Runtime for ML on the SCC Nov 2012
MARC 2012 RWTH Aachen

Eliminating Read Barriers through Procrastination and Cleanliness Jun 2012
ISMM 2012, Beijing
Wrestling Wednesdays, Microsoft Research, Cambridge May 2012

Lightweight Concurrency in GHC May 2012
Wrestling Wednesdays Microsoft Research, Cambridge

Efficient Session Type guided Distributed Interaction Jun 2012
COORDINATION 2012 CWI Amsterdam

❖ Professional Service

- Program Committee member: SPLASH-MARC symposium, 2013.
- Artifact Evaluation Committee member: PLDI 2015.
- Reviewer: POPL, ICFP, ASPLOS, TLDI, Concurrency and Computation: Practice and Experience, Software: Practice and Experience.

❖ Awards and Recognitions

- Research Fellowship, Royal Commission for the Exhibition of 1851, 2015–2018, £102,000.
- Research Fellowship, Darwin College, Cambridge, 2015–2018, £900.
- Maurice H. Halstead Memorial Award for outstanding research in Software Engineering, Purdue University, 2014, \$4,000.

- Best paper award at Many-core Architecture Research Symposium at RWTH-Aachen, 2012, \$1,000.
- Invited paper in Science of Computer Programming, Vol. 78, Iss. 2 (Feb 2013).
- Glasgow Haskell Compiler (GHC) Committer.
- SIGPLAN PAC travel grant for PLDI 2012 and POPL 2014, \$1,500 each.
- NSF travel grant for ICFP 2013, \$2,000.