

# 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

I am working on a variety of projects 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

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

## ❖ Conference Publications

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

## ❖ Workshop Publications

- Migrating MultiMLton to the Cloud** Sep 2013  
 W4 KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan  
*ML Workshop*
- Scalable Lightweight Task Management Schemes for MIMD Processors** Apr 2011  
 W3 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

- Maurice H. Halstead Memorial Award for outstanding research in Software Engineering, Purdue University, 2014.
- Best paper award at Many-core Architecture Research Symposium at RWTH-Aachen, 2012.
- 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.
- NSF travel grant for ICFP 2013.