

Curriculum Vitae

January 17, 2016

KC Sivaramakrishnan

Computer Laboratory
University of Cambridge
sk826@cl.cam.ac.uk

<http://kcsrk.info>

15 JJ Thomson Avenue
Cambridge CB3 0FD
Tel: +44 79828 42499

❖ 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.

Intern, Advanced Numerical Research and Analysis Group

Advisor: Sankar Chnab

Dec 2007 – Apr 2008

Hyderabad, India

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 **Composable Scheduler Activations for Haskell** Nov 2015
KC Sivaramakrishnan, Tim Harris, Simon Marlow, Simon Peyton Jones
Accepted with minor revisions for Journal of Functional Programming (JFP)
- J1 **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
- J0 **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 (MARC)
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 **Effective Concurrency with Algebraic Effects** Sep 2015
Stephen Dolan, Leo White, KC Sivaramakrishnan, Jeremy Yallop and Anil Madhavapeddy
OCaml Workshop

W3	Migrating MultiMLton to the Cloud KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>ML Workshop</i>	Sep 2013
W2	Scalable Lightweight Task Management Schemes for MIMD Processors Daniel G. Waddington, Chen Tian, KC Sivaramakrishnan <i>Workshop on Systems for Future Multi-Core Architectures (SFMA)</i>	Apr 2011
W1	The Design Rationale for MultiMLton Suresh Jagannathan, Armand Navabi, KC Sivaramakrishnan, Lukasz Ziarek <i>ML Workshop</i>	Sep 2010
W0	Lightweight Asynchrony using Parasitic Threads KC Sivaramakrishnan, Lukasz Ziarek, Raghavendra Prasad, Suresh Jagannathan <i>Workshop on Declarative Aspects of Multicore Programming (DAMP)</i>	Jan 2010

❖ Technical Reports and Drafts

T2	Featherweight Threads for Communication KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>Purdue University Computer Science Technical Report – TR-11-018</i>	Nov 2011
----	--	----------

❖ Teaching/Advising

- Guest Lectures:
 - Arrows, Advanced Functional Programming, University of Cambridge, Lent 2015–16.
 - Debugging, Programming in C and C++, University of Cambridge, Michaelmas 2015–16.
- Supervisions at University of Cambridge:
 - Algorithms, Lent 2015–16.
 - Concurrent and Distributed Systems, Lent 2015–16.
 - Concurrent and Distributed Systems, Michaelmas 2015–16.
 - Object-oriented Programming, Michaelmas 2015–16.
- Teaching assistantships at Purdue University
 - Undergraduate C Programming (CS180), Aug 2012 – Dec 2012.
 - Graduate Programming Languages (CS565), Aug 2011 – Dec 2011.
- Projects supervised:
 - James Wright, University of Cambridge, Mechanized semantics of Algebraic Effects in OCaml, Michaelmas 2015 – present.
 - Armael Gueneau, ENS de Lyon, Algebraic Effects for js_of_ocaml, Sep 2015 – present.
 - Theo Laurent, ENS de Lyon, Reagents for Multicore OCaml, May 2015 – Aug 2015.
 - Guillaín Potron, ENS de Lyon, Semantics of Irmin branch-consistent data store, March 2015 – Aug 2015.

❖ Talks

OCaml Platform: Update OCaml Consortium Meeting	Nov 2015 Paris, France
Multicore OCaml: Update OCaml Developer's Meeting	Nov 2015 Paris, France
Effective Concurrency with Algebraic Effects OCaml Workshop 2015	Sep 2015 Vancouver, Canada

Functional Programming Abstractions for Weakly Consistent Systems PhD Defense	<i>Dec 2014</i> Purdue University
Functional Abstractions for Practical and Scalable Concurrent Programming Invited Lecture	<i>Mar 2014</i> Microsoft Research, Cambridge, UK
Rx-CML: A Prescription for Safely Relaxing Synchrony PADL 2014	<i>Jan 2014</i> San Diego, CA
Migrating MultiMLton to the Cloud ML Workshop 2013	<i>Sep 2013</i> Boston, MA
A Coherent and Managed Runtime for ML on the SCC MARC 2012	<i>Nov 2012</i> RWTH Aachen
Eliminating Read Barriers through Procrastination and Cleanliness ISMM 2012, Beijing	<i>Jun 2012</i>
Wrestling Wednesdays, Microsoft Research, Cambridge	<i>May 2012</i>
Lightweight Concurrency in GHC Wrestling Wednesdays	<i>May 2012</i> Microsoft Research, Cambridge
Efficient Session Type guided Distributed Interaction COORDINATION 2012	<i>Jun 2012</i> CWI Amsterdam

❖ Professional Service

- Program Committee member: SPLASH-MARC symposium, 2013.
- Artifact Evaluation Committee member: PLDI 2015, PPOPP/CGO 2016.
- 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.

❖ References

Suresh Jagannathan
Professor
Department of Computer Science
Purdue University
305 N University St
West Lafayette, IN 47906, USA
suresh@cs.purdue.edu

Anil Madhavapeddy
University Lecturer
Computer Laboratory
University of Cambridge
15 JJ Thomson Av
Cambridge, CB3 0FD, UK
anil.madhavapeddy@cl.cam.ac.uk

Jan Vitek

Professor of Computer Science
College of Computer & Information Science
Northeastern University
440 Huntinton Av
Boston, MA 02115, USA
j.vitek@neu.edu

Simon Peyton Jones

Principal Researcher
Programming Principles and Tools
Microsoft Research Ltd
21 Station Rd
Cambridge CB1 2FB, UK
simonpj@microsoft.com