Curriculum Vitae

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 *May 2011 – Dec 2014*
Purdue University, USA

Thesis Title: **Functional Programming Abstractions for Weakly Consistent Systems**
Advisor: Suresh Jagannathan

Master of Science — Computer Science *Aug 2008 – May 2011*
Purdue University, USA

GPA: 3.94/4

Bachelor of Engineering — Computer Science and Engineering *Aug 2004 – May 2008*
PSG College of Technology
Anna University, India

GPA: 9.55/10

❖ Experience

Research Associate, University of Cambridge *Dec 2014 – present*
Advisor: Anil Madhavapeddy
Cambridge, UK

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

Research Assistant, Purdue University *Aug 2008 – Dec 2014*
Advisor: Suresh Jagannathan
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 West Lafayette, IN, USA
Undergraduate C Programming (CS180) *Aug 2012 – Dec 2012*
Graduate Programming Languages (CS565) *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 *Feb 2012 – May 2012*
Advisors: Tim Harris, Simon Marlow, and Simon Peyton Jones
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) *May 2010 – Aug 2010*
Advisor: Daniel Waddington
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 *Dec 2007 – Apr 2008*
  Advisor: Sankar Chnab *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

Composable Scheduler Activations for Haskell *Nov 2015*

J2 KC Sivaramakrishnan, Tim Harris, Simon Marlow, Simon Peyton Jones
Accepted with minor revisions for Journal of Functional Programming (JFP)

MultiMLton: A Multicore-aware Runtime for Standard ML *Nov 2014*

J1 KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
Journal of Functional Programming (JFP), 24(6): 613 – 674

Efficient Sessions *Feb 2013*

J0 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*

  KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
C5 *Many-core Architecture Research Community Symposium (MARC)*
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

Effective Concurrency with Algebraic Effects *Sep 2015*

W4 Stephen Dolan, Leo White, KC Sivaramakrishnan, Jeremy Yallop and Anil Madhavapeddy
OCaml Workshop

W3   **Migrating MultiMLton to the Cloud**   *Sep 2013*
KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
ML Workshop

W2   **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)

W1   **The Design Rationale for MultiMLton**   *Sep 2010*
Suresh Jagannathan, Armand Navabi, KC Sivaramakrishnan, Lukasz Ziarek
ML Workshop

W0   **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   **Featherweight Threads for Communication**   *Nov 2011*
KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
Purdue University Computer Science Technical Report – TR-11-018

❖ Teaching/Advising

- Guest Lectures:

  - Arrows, Advanced Functional Programming, University of Cambridge, Lent 2015–16.
  - Debugging, Programming in C and C++, University of Cambridge, Michelmas 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, Michelmas 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.
  - Guillain Potron, ENS de Lyon, Semantics of Irmin branch-consistent data store, March 2015 – Aug 2015.

❖ Talks

OCaml Platform: Update   *Nov 2015*
OCaml Consortium Meeting   Paris, France

Multicore OCaml: Update   *Nov 2015*
OCaml Developer's Meeting   Paris, France

Effective Concurrency with Algebraic Effects   *Sep 2015*
OCaml Workshop 2015   Vancouver, Canada

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	
ISMM 2012, Beijing	*Jun 2012*
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, 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.