Curriculum Vitae

February 11, 2019

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
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

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

❖ Experience

Senior Research Associate, University of Cambridge
Nov 2017 – present
Cambridge, UK
Advisors: Alan Mycroft, Anil Madhavapeddy

Research Fellow, Royal Commission for the Exhibition of 1851
Oct 2015 – present

Research Fellow, Darwin College, Cambridge
Oct 2015 – present

Research Associate, University of Cambridge
Dec 2014 – Oct 2017

Research Assistant, Purdue University
Aug 2008 – Dec 2014
West Lafayette, IN, USA
Advisor: Suresh Jagannathan

Teaching Assistant, Purdue University
West Lafayette, IN, USA
Undergraduate C Programming (CS180)
Aug 2012 – Dec 2012
Graduate Programming Languages (CS565)
Aug 2011 – Dec 2011

Research Intern, Microsoft Research, Cambridge
Feb 2012 – May 2012
Cambridge, UK
Advisors: Tim Harris, Simon Marlow, and Simon Peyton Jones

Research Intern, Samsung Information Systems America (R&D)
May 2010 – Aug 2010
San Jose, CA, USA
Advisor: Daniel Waddington

Intern, Advanced Numerical Research and Analysis Group
Dec 2007 – Apr 2008
Hyderabad, India
Advisor: Sankar Chnab

❖ Grants, Awards and Recognitions

- Co-I, Feasibility of an Operating System for Interspatial Networking in a Built Environment, Centre for Digital Built Britain (CDBB), Mar 2018, £24,000.
- 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.
- 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.

❖ Service

- Organizer, Dagstuhl Seminar on "Algebraic Effect Handlers go Mainstream", Apr 2018.
- Program Committee member: PMLDC@ECOOP 2017, Off-the-beaten track (OBT) 2017, OCaml Workshop 2016, SPLASH-MARC symposium, 2013.
- Artifact Evaluation Committee member: ICFP 2018, PLDI 2015, PPoPP/CGO 2016.
- Reviewer: ECOOP, TODS, JFP, POPL, ICFP, ASPLOS, TLDI, Concurrency and Computation: Practice and Experience, Software: Practice and Experience.
- Organizer for Darwin College Science Seminar Series, Oct 2015 – May 2017.

❖ Journal Publications

J6
Concurrent System Programming with Effect Handlers   *Nov 2017*
Stephen Dolan, Spiros Eliopolous, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White
Post-proceedings of the Symposium on Trends in Functional Programming (TFP) (accepted)

J5
Eff directly in OCaml   *Oct 2017*
Oleg, Kiselyov, KC Sivaramakrishnan
Post-proceedings of the ML Workshop (accepted)

J4
Composable Scheduler Activations for Haskell   *Jun 2016*
KC Sivaramakrishnan, Tim Harris, Simon Marlow, Simon Peyton Jones
Journal of Functional Programming (JFP)

J3
Representation without Taxation: A Uniform, Low-Overhead, and High-Level Interface to Eventually Consistent Key-Value Stores   *Mar 2016*
KC Sivaramakrishnan, Gowtham Kaki, Suresh Jagannathan
IEEE Data Engineering Bulletin, 39(1): 52 – 64

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

C10
Bounding Data Races in Space and Time   *Jun 2018*
Stephen Dolan, KC Sivaramakrishnan, Anil Madhavapeddy
International Conference on Programming Language Design and Implementation (PLDI)

C9
Continuation Passing Style for Effect Handlers   *Sep 2017*
Daniel Hillerstrm, Sam Lindley, Robert Atkey, KC Sivaramakrishnan
International Conference on Formal Structures for Computation and Deduction (FSCD)

C8 **DaLi : Database as a Library** *May 2017*
Gowtham Kaki, KC Sivaramakrishnan, Thomas Gazagnaire, Anil Madhavapeddy, Suresh Jagannathan
The 2nd Summit on Advances in Programming Languages (SNAPL)
Oral Presentation

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

W14 **An Architecture for Interspatial Communication** *Apr 2018*
Anil Madhavapeddy, KC Sivaramakrishnan, Gemma Gordon, Thomas Gazagnaire
Hot Topics in Pervasive Mobile and Online Social Networking (HotPOST), 2018

W13 **A Memory Model for Multicore OCaml** *Sep 2017*
Stephen Dolan and KC Sivaramakrishnan
OCaml Workshop

W12 **Effectively Tackling the Awkward Squad** *Sep 2017*
Stephen Dolan, Spiros Eliopolous, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White
OCaml Workshop

W11 **Mergeable Types** *Sep 2017*
Gowtham Kaki, KC Sivaramakrishnan, Samodya Abeysiriwardane, Suresh Jagannathan
ML Workshop

W10 **Concurrent System Programming with Effect Handlers** *Jun 2017*
Stephen Dolan, Spiros Eliopolous, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White
Symposium on Trends in Functional Programming (TFP)

W9 **Eff directly in OCaml** *Mar 2017*
Oleg Kiselyov and KC Sivaramakrishnan
JSSST Workshop on Programming and Programming Languages

W8 **Lock-free programming for the masses** *Sep 2016*
KC Sivaramakrishnan, Tho Laurent
OCaml Workshop

W7 **Compiling Links Effect Handlers to the OCaml Backend** *Sep 2016*
Daniel Hillestrm, Sam Lindley, KC Sivaramakrishnan
ML Worshop

W6 **Eff Directly in OCaml** *Sep 2016*
Oleg Kiselyov and KC Sivaramakrishnan
ML Workshop

W5 **Effective Concurrency with Algebraic Effects** *Sep 2015*
Stephen Dolan, Leo White, KC Sivaramakrishnan, Jeremy Yallop and Anil Madhavapeddy
OCaml Workshop

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

T1 **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 '16.
  - Debugging, Programming in C and C++, University of Cambridge, Michelmas '15.

- Supervisions at University of Cambridge:
  - Databases, Michelmas '18, Lent '17, Michaelmas '17, Lent '16.
  - Concurrent and Distributed Systems, Lent '17, Michaelmas '17, Lent '16, Michaelmas '16, Lent '15.
  - Algorithms, Lent '15.
  - 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:

- Simon Fowler, University of Edinburgh, `cmm_of_wasm`: An ahead-of-time compiler for WebAssembly, May 2018 – July 2018.
- Matevz Polijanc, University of Cambridge, A Reactive Programming model in OCaml, Oct 2017 – Mar 2018.
- Charlie Crisp, University of Cambridge, A Blockchain in Pure OCaml, Oct 2017 – Mar 2018.
- Henry Mercer, University of Cambridge, Systematic Concurrency Testing for Multicore OCaml, Oct 2017 – Mar 2018.
- Nicolas Assouad, ENS Paris, Hardware Support for Composable Lock-free Transactions, Mar 2017 – Jun 2017.
- Matt Harrison, University of Cambridge, Secure Decentralized Apps, Sep 2016 – present.
- Maxime Lesourd, ENS de Lyon, Verified CPS translation of handlers, Sep 2016 – Mar 2017.
- Philip Dexter, Binghampton University, Approximate computing for OCaml, May 2016 – Aug 2016.
- James Wright, University of Cambridge, Mechanized semantics of Algebraic Effects in OCaml, Sep 2015 – Mar 2016.
- Armael Gueneau, ENS de Lyon, Algebraic Effects for js_of_ocaml, Sep 2015 – Mar 2016.
- Theo Laurent, ENS, 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

Retrofitting a Concurrent GC onto OCaml *Oct 2018*
GLASS Seminar University of Glasgow

Concurrent System Programming with Effect Handlers *Oct 2018*
Department Seminar University of Sussex

State of Multicore OCaml *Jun 2018*
Multicore Meeting INRIA Gallium, Paris

Bounding Data Races in Space and Time *Feb 2018*
Department Seminar Computer Science and Engineering, IIT Madras

A deep dive into Multicore OCaml Garbage Collector *Jul 2017*
System Research Group Seminar Computer Laboratory, University of Cambridge

Multicore OCaml GC *Jun 2017*
JaneStreet Group New York, NYC

Composable lock-free programming for Multicore OCaml *Nov 2016*
ABCD Meeting University of Edinburgh

Practical Algebraic Effect Handlers in Multicore OCaml *Nov 2016*
LFCS Seminar University of Edinburgh

Effective Concurrency and Parallelism in Multicore OCaml *Nov 2016*
PL Seminar Indian Institute of Technology, Madras

Effective Concurrency and Parallelism in Multicore OCaml *Nov 2016*
PL Seminar Indian Institute of Technology, Bombay

Effective parallelism with Reagents *Sep 2016*
Facebook Faculty Summit London, UK

Multicore OCaml and Programming with Reagents *Aug 2016*
LDN Functionals Jane Street UK, London

Effect handlers in Multicore OCaml *Mar 2016*
Dagstuhl Seminar Dagstuhl, Germany

Arrows and Reagents *Mar 2016*
Invited Lecture, Advanced Functional Programming Cambridge, UK

Concurrent and Multicore OCaml: A deep dive *Jan 2016*
Facebook Tech Talk Menlo Park, CA

OCaml Platform: Update
OCaml Consortium Meeting

Nov 2015
Paris, France

Multicore OCaml: Update
OCaml Developer's Meeting

Nov 2015
Paris, France

Silence is Golden: Controlling Communication and Coordination in Distributed Databases
Darwin College Science Seminar

Oct 2015
Cambridge, UK

Effective Concurrency with Algebraic Effects
OCaml Workshop 2015

Sep 2015
Vancouver, Canada

Quelea: Declarative Programming over Eventually Consistent Data Stores
Computer Laboratory, University of Cambridge

Apr 2015
Cambridge, UK

Functional Programming Abstractions for Weakly Consistent Systems
PhD Defense

Dec 2014
Purdue University

Functional Abstractions for Practical and Scalable Concurrent Programming
Invited Lecture

Mar 2014
Microsoft Research, Cambridge, UK

Rx-CML: A Prescription for Safely Relaxing Synchrony
PADL 2014

Jan 2014
San Diego, CA

Migrating MultiMLton to the Cloud
ML Workshop 2013

Sep 2013
Boston, MA

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

Nov 2012
RWTH Aachen

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

Jun 2012
May 2012

Lightweight Concurrency in GHC
Wrestling Wednesdays

May 2012
Microsoft Research, Cambridge

Efficient Session Type guided Distributed Interaction
COORDINATION 2012

Jun 2012
CWI Amsterdam

❖ 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