

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

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

Advisors: Alan Mycroft, Anil Madhavapeddy

Nov 2017 – present
Cambridge, UK

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

Advisor: Suresh Jagannathan

Aug 2008 – Dec 2014
West Lafayette, IN, USA

Teaching Assistant, Purdue University

Undergraduate C Programming (CS180)

Graduate Programming Languages (CS565)

West Lafayette, IN, USA

Aug 2012 – Dec 2012

Aug 2011 – Dec 2011

Research Intern, Microsoft Research, Cambridge

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

Feb 2012 – May 2012
Cambridge, UK

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

Advisor: Daniel Waddington

May 2010 – Aug 2010
San Jose, CA, USA

Intern, Advanced Numerical Research and Analysis Group

Advisor: Sankar Chnab

Dec 2007 – Apr 2008
Hyderabad, India

❖ 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

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|----|---|----------|
| | Concurrent System Programming with Effect Handlers | Nov 2017 |
| J6 | Stephen Dolan, Spiros Eliopoulos, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White
<i>Post-proceedings of the Symposium on Trends in Functional Programming (TFP) (accepted)</i> | |
| | Eff directly in OCaml | Oct 2017 |
| J5 | Oleg, Kiselyov, KC Sivaramakrishnan
<i>Post-proceedings of the ML Workshop (accepted)</i> | |
| | Composable Scheduler Activations for Haskell | Jun 2016 |
| J4 | KC Sivaramakrishnan, Tim Harris, Simon Marlow, Simon Peyton Jones
<i>Journal of Functional Programming (JFP)</i> | |
| | Representation without Taxation: A Uniform, Low-Overhead, and High-Level Interface to Eventually Consistent Key-Value Stores | Mar 2016 |
| J3 | KC Sivaramakrishnan, Gowtham Kaki, Suresh Jagannathan
<i>IEEE Data Engineering Bulletin</i> , 39(1): 52 – 64 | |
| | MultiMLton: A Multicore-aware Runtime for Standard ML | Nov 2014 |
| J2 | KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
<i>Journal of Functional Programming (JFP)</i> , 24(6): 613 – 674 | |
| | Efficient Sessions | Feb 2013 |
| J1 | KC Sivaramakrishnan, Mohammad Qudeisat, Lukasz Ziarek, Karthik Nagaraj, Patrick Eugster
<i>Science of Computer Programming (SCP)</i> , 78(2): 147 – 167
Invited paper | |

❖ Conference Publications

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| | Continuation Passing Style for Effect Handlers | Sep 2017 |
| C9 | Daniel Hillerstrm, Sam Lindley, Robert Atkey, KC Sivaramakrishnan
<i>International Conference on Formal Structures for Computation and Deduction (FSCD)</i> | |
| | DaLi : Database as a Library | May 2017 |
| C8 | Gowtham Kaki, KC Sivaramakrishnan, Thomas Gazagnaire, Anil Madhavapeddy, Suresh Jagannathan
<i>The 2nd Summit on Advances in Programming Languages (SNAPL)</i>
Oral Presentation | |

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

❖ Workshop Publications

W13	A Memory Model for Multicore OCaml Stephen Dolan and KC Sivaramakrishnan <i>OCaml Workshop</i>	Sep 2017
W12	Effectively Tackling the Awkward Squad Stephen Dolan, Spiros Eliopoulos, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White <i>OCaml Workshop</i>	Sep 2017
W11	Mergeable Types Gowtham Kaki, KC Sivaramakrishnan, Samodya Abeysiriwardane, Suresh Jagannathan <i>ML Workshop</i>	Sep 2017
W10	Concurrent System Programming with Effect Handlers Stephen Dolan, Spiros Eliopoulos, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White <i>Symposium on Trends in Functional Programming (TFP)</i>	Jun 2017
W9	Eff directly in OCaml Oleg Kiselyov and KC Sivaramakrishnan <i>JSSST Workshop on Programming and Programming Languages</i>	Mar 2017
W8	Lock-free programming for the masses KC Sivaramakrishnan, Tho Laurent <i>OCaml Workshop</i>	Sep 2016
W7	Compiling Links Effect Handlers to the OCaml Backend Daniel Hillestrm, Sam Lindley, KC Sivaramakrishnan <i>ML Workshop</i>	Sep 2016

W6	Eff Directly in OCaml Oleg Kiselyov and KC Sivaramakrishnan <i>ML Workshop</i>	Sep 2016
W5	Effective Concurrency with Algebraic Effects Stephen Dolan, Leo White, KC Sivaramakrishnan, Jeremy Yallop and Anil Madhavapeddy <i>OCaml Workshop</i>	Sep 2015
W4	Migrating MultiMLton to the Cloud KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>ML Workshop</i>	Sep 2013
W3	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
W2	The Design Rationale for MultiMLton Suresh Jagannathan, Armand Navabi, KC Sivaramakrishnan, Lukasz Ziarek <i>ML Workshop</i>	Sep 2010
W1	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

T1	Featherweight Threads for Communication KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>Purdue University Computer Science Technical Report – TR-11-018</i>	Nov 2011
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❖ Teaching/Advising

- Guest Lectures:
 - Arrows, Advanced Functional Programming, University of Cambridge, Lent '16.
 - Debugging, Programming in C and C++, University of Cambridge, Michaelmas '15.
- Supervisions at University of Cambridge:
 - Databases, 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:
 - Matevz Polijanc, University of Cambridge, A Reactive Programming model in OCaml, Oct 2017 – Present.
 - Charlie Crisp, University of Cambridge, A Blockchain in Pure OCaml, Oct 2017 – Present.
 - Henry Mercer, University of Cambridge, Systematic Concurrency Testing for Multicore OCaml, Oct 2017 – Present.
 - 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, Binghamton 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

A deep dive into Multicore OCaml Garbage Collector System Research Group Seminar	<i>Jul 2017</i> Computer Laboratory, University of Cambridge
Multicore OCaml GC JaneStreet Group	<i>Jun 2017</i> New York, NYC
Composable lock-free programming for Multicore OCaml ABCD Meeting	<i>Nov 2016</i> University of Edinburgh
Practical Algebraic Effect Handlers in Multicore OCaml LFCS Seminar	<i>Nov 2016</i> University of Edinburgh
Effective Concurrency and Parallelism in Multicore OCaml PL Seminar	<i>Nov 2016</i> Indian Institute of Technology, Madras
Effective Concurrency and Parallelism in Multicore OCaml PL Seminar	<i>Nov 2016</i> Indian Institute of Technology, Bombay
Effective parallelism with Reagents Facebook Faculty Summit	<i>Sep 2016</i> London, UK
Multicore OCaml and Programming with Reagents LDN Functionals	<i>Aug 2016</i> Jane Street UK, London
Effect handlers in Multicore OCaml Dagstuhl Seminar	<i>Mar 2016</i> Dagstuhl, Germany
Arrows and Reagents Invited Lecture, Advanced Functional Programming	<i>Mar 2016</i> Cambridge, UK
Concurrent and Multicore OCaml: A deep dive Facebook Tech Talk	<i>Jan 2016</i> Menlo Park, CA
OCaml Platform: Update OCaml Consortium Meeting	<i>Nov 2015</i> Paris, France
Multicore OCaml: Update OCaml Developer's Meeting	<i>Nov 2015</i> Paris, France
Silence is Golden: Controlling Communication and Coordination in Distributed Databases Darwin College Science Seminar	<i>Oct 2015</i> Cambridge, UK
Effective Concurrency with Algebraic Effects OCaml Workshop 2015	<i>Sep 2015</i> Vancouver, Canada
Quelea: Declarative Programming over Eventually Consistent Data Stores Computer Laboratory, University of Cambridge	<i>Apr 2015</i> Cambridge, UK
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

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

Jun 2012

Wrestling Wednesdays, Microsoft Research, Cambridge

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

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Department of Computer Science

Purdue University

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West Lafayette, IN 47906, USA

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Anil Madhavapeddy

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Jan Vitek

Professor of Computer Science

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