

# 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

- 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)*

	<b>DaLi : Database as a Library</b>	May 2017
C8	Gowtham Kaki, KC Sivaramakrishnan, Thomas Gazagnaire, Anil Madhavapeddy, Suresh Jagannathan <i>The 2nd Summit on Advances in Programming Languages (SNAPL)</i> <b>Oral Presentation</b>	
	<b>Declarative Programming over Eventually Consistent Data Stores</b>	Jun 2015
C7	KC Sivaramakrishnan, Gowtham Kaki, Suresh Jagannathan <i>International Conference on Programming Language Design and Implementation (PLDI)</i>	
	<b>Rx-CML: A Prescription for Safely Relaxing Synchrony</b>	Jan 2014
C6	KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>Symposium on Practical Aspects of Declarative Languages (PADL)</i>	
	<b>A Coherent and Managed Runtime for ML on the SCC</b>	Nov 2012
C5	KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>Many-core Architecture Research Community Symposium (MARC)</i> <b>Best paper award</b>	
	<b>Eliminating Read Barriers through Procrastination and Cleanliness</b>	Jun 2012
C4	KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>International Symposium on Memory Management (ISMM)</i>	
	<b>Composable Asynchronous Events</b>	Jun 2011
C3	Lukasz Ziarek, KC Sivaramakrishnan, Suresh Jagannathan <i>International Conference on Programming Language Design and Implementation (PLDI)</i>	
	<b>Efficient Session Type Guided Distributed Interaction</b>	June 2010
C2	KC Sivaramakrishnan, Karthik Nagaraj, Lukasz Ziarek, Patrick Eugster <i>International Conference on Coordination Models and Languages (COORDINATION)</i>	
	<b>Partial Memoization of Concurrency and Communication</b>	Sep 2009
C1	Lukasz Ziarek, KC Sivaramakrishnan, Suresh Jagannathan <i>International Conference on Functional Programming (ICFP)</i>	

## ❖ Workshop Publications

	<b>An Architecture for Interspatial Communication</b>	Apr 2018
W14	Anil Madhavapeddy, KC Sivaramakrishnan, Gemma Gordon, Thomas Gazagnaire <i>Hot Topics in Pervasive Mobile and Online Social Networking (HotPOST), 2018</i>	
	<b>A Memory Model for Multicore OCaml</b>	Sep 2017
W13	Stephen Dolan and KC Sivaramakrishnan <i>OCaml Workshop</i>	
	<b>Effectively Tackling the Awkward Squad</b>	Sep 2017
W12	Stephen Dolan, Spiros Eliopoulos, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White <i>OCaml Workshop</i>	
	<b>Mergeable Types</b>	Sep 2017
W11	Gowtham Kaki, KC Sivaramakrishnan, Samodya Abeysiriwardane, Suresh Jagannathan <i>ML Workshop</i>	
	<b>Concurrent System Programming with Effect Handlers</b>	Jun 2017
W10	Stephen Dolan, Spiros Eliopoulos, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White <i>Symposium on Trends in Functional Programming (TFP)</i>	
	<b>Eff directly in OCaml</b>	Mar 2017
W9	Oleg Kiselyov and KC Sivaramakrishnan <i>JSSST Workshop on Programming and Programming Languages</i>	

W8	<a href="#">Lock-free programming for the masses</a> KC Sivaramakrishnan, Tho Laurent <i>OCaml Workshop</i>	Sep 2016
W7	<a href="#">Compiling Links Effect Handlers to the OCaml Backend</a> Daniel Hillestrm, Sam Lindley, KC Sivaramakrishnan <i>ML Workshop</i>	Sep 2016
W6	<a href="#">Eff Directly in OCaml</a> Oleg Kiselyov and KC Sivaramakrishnan <i>ML Workshop</i>	Sep 2016
W5	<a href="#">Effective Concurrency with Algebraic Effects</a> Stephen Dolan, Leo White, KC Sivaramakrishnan, Jeremy Yallop and Anil Madhavapeddy <i>OCaml Workshop</i>	Sep 2015
W4	<a href="#">Migrating MultiMLton to the Cloud</a> KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>ML Workshop</i>	Sep 2013
W3	<a href="#">Scalable Lightweight Task Management Schemes for MIMD Processors</a> Daniel G. Waddington, Chen Tian, KC Sivaramakrishnan <i>Workshop on Systems for Future Multi-Core Architectures (SFMA)</i>	Apr 2011
W2	<a href="#">The Design Rationale for MultiMLton</a> Suresh Jagannathan, Armand Navabi, KC Sivaramakrishnan, Lukasz Ziarek <i>ML Workshop</i>	Sep 2010
W1	<a href="#">Lightweight Asynchrony using Parasitic Threads</a> 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	<a href="#">Featherweight Threads for Communication</a> 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, 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

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

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