Curriculum Vitae

September 19, 2021

KC Sivaramakrishnan
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Summary

I am interested in applying programming language techniques to improve concurrent, parallel, distributed and operating systems.

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

Assistant Professor, Indian Institute of Technology, Madras *Jan 2019 – present*

Senior Research Associate, University of Cambridge *Nov 2017 – Dec 2018*
Advisors: Alan Mycroft, Anil Madhavapeddy
Cambridge, UK

Research Fellow, Royal Commission for the Exhibition of 1851 *Oct 2015 – Oct 2018*

Research Fellow, Darwin College, Cambridge *Oct 2015 – Oct 2018*

Research Associate, University of Cambridge *Dec 2014 – Oct 2017*

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

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*
Advisors: Tim Harris, Simon Marlow, and Simon Peyton Jones
Cambridge, UK

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

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

Grants, Awards and Recognitions

- Distinguished paper award for "Retrofitting Parallelism onto OCaml" at ICFP 2020.
- Class of 1991 Award for Young Faculty in Computer Science and Engineering, IIT Madras, 2019.
- PI, Multicore Support for Tezos blockchain, Jun 2019, GBP 194,000.
- PI, Qilin: Scalable Concurrent Unikernels with Effect Handlers, Jan 2019, INR 500,000.

- 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.

❖ Academic Service

- **Organizer**, Dagstuhl Seminar on "Algebraic Effect Handlers go Mainstream", Apr 2018.
- **Organizer**, Shonan Meeting No.143 on Programming Language Support for Data-intensive Applications, June 2019.
- **Editor**, Special Issue of the Journal of Functional Programming (JFP) on the Theory and Practice of Algebraic Effects and Handlers, 2019.
- **Program Committee Chair**: ML Workshop 2019.
- **Program Committee member**: PLDI 2022, PEPM 2022, TyDe 2021, GPCE 2021, PADL 2021, PaPoC 2021, ICFP 2020, PAPOC@EuroSys 2020, OCaml Workshop 2019, PMLDC@ECOOP 2017, Off-the-beaten track (OBT) 2017, OCaml Workshop 2016, SPLASH-MARC symposium, 2013.
- **External Review Committee**: ICFP 2019.
- **Artifact Evaluation Committee Chair**: ESOP 2022.
- **Artifact Evaluation Committee member**: ICFP 2018, PLDI 2015, PPoPP/CGO 2016.
- **Reviewer**: JFP 2021, PLDI 2020, ESOP 2020, JPDC 2020, LICS 2019, ECOOP 2019, TODS 2019, JFP 2018, POPL 2014, ICFP 2013, ASPLOS 2013, TLDI 2013, Concurrency and Computation: Practice and Experience 2013, Software: Practice and Experience 2012.

❖ Institutional Service

- Board Member, Industrial Consultancy and Sponsored Research (ICSR), IIT Madras, 2021 – 2022.
- Department Vision Committee, Computer Science and Engineering, IIT Madras, 2021.
- Department Website Revamp Committee, Computer Science and Engineering, IIT Madras, 2021.
- Faculty Advisor, BTech batch, Computer Science and Engineering, IIT Madras, 2021.
- Organizer for Darwin College Science Seminar Series, Oct 2015 – May 2017.
- Interviewer for Undergraduate Admissions to Computer Science, Christ's College, Cambridge, 2016, 2017 and 2018

❖ Edited Publications

E2 **Special Issue on the Theory and Practice of Algebraic Effects and Handlers** *Jan 2021*
KC Sivaramakrishnan, Andrej Bauer (eds.)
Journal of Functional Programming

E1 **Algebraic Effect Handlers go Mainstream** *Apr 2018*
KC Sivaramakrishnan, Daan Leijen, Matija Pretnar, Tom Schrijvers
Dagstuhl Reports, Volume 8, Issue 4, 2018

❖ Journal Publications

J9 **Retrofitting Parallelism onto OCaml** *Aug 2020*
KC Sivaramakrishnan, Stephen Dolan, Leo White, Sadiq Jaffer, Tom Kelly, Anmol Sahoo, Sudha Parimala, Atul Dhiman, Anil Madhavapeddy
Proceedings of the ACM on Programming Languages (PACMPL), issue ICFP 2020
Distinguished paper

J8 **Mergeable Replicated Data Types** *Oct 2019*
Gowtham Kaki, Swarn Priya, KC Sivaramakrishnan, Suresh Jagannathan
Proceedings of the ACM on Programming Languages (PACMPL), issue OOPSLA 2019

J7 **Safe Replication through Bounded Concurrency Verification** *Nov 2018*
Gowtham Kaki, Kapil Earanky, KC Sivaramakrishnan, Suresh Jagannathan
Proceedings of the ACM on Programming Languages (PACMPL), issue OOPSLA 2018

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

C14 **Retrofitting Effect Handlers to OCaml** *Jun 2021*
KC Sivaramakrishnan, Stephen Dolan, Leo White, Sadiq Jaffer, Tom Kelly, Anil Madhavapeddy
International Conference on Programming Language Design and Implementation (PLDI), 2021

C13 **ConFuzz: Coverage-guided Property Fuzzing for Event-driven Programs** *Jan 2021*
Sumit Padhiyar, KC Sivaramakrishnan
Proceedings of the 23rd International Symposium on Practical Aspects of Declarative Languages (PADL), 2021
Distinguished paper

C12 **Banyan: Coordination-free Distributed Transactions over Mergeable Types** *Dec 2020*
Shashank Shakhar Dubey, KC Sivaramakrishnan, Thomas Gazagnaire, Anil Madhavapeddy
Proceedings of the 18th Asian Symposium on Programming Languages and Systems (APLAS), 2020

C11 **Version Control Is For Your Data Too** *May 2019*
Gowtham Kaki, KC Sivaramakrishnan, Suresh Jagannathan
The 3rd Summit on Advances in Programming Languages (SNAPL), 2019

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

W16 **Certified Mergeable Replicated Data Types** *Apr 2021*
Vimala Soundarapandian, KC Sivaramakrishnan, Kartik Nagar
8th Workshop on Principles and Practice of Consistency for Distributed Data (PaPoC), 2021

W15 **Handlers.js** *Apr 2018*
Daniel Hillerstrm, Sam Lindley, Robert Atkey, KC Sivaramakrishnan, Jeremy Yallop
Programming Technology for the Future Web (ProWeb), 2019

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

- Lecturer:

    - Programs and Proofs, IIT Madras, Spring ’20, Spring ’21.
    - Paradigms of Programming, IIT Madras, Monsoon ’19, Monsoon ’20.
- 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.

❖ Advising

- PhD Students
    - Sai Venkata Krishnan, 2021 – present
    - Vimala Soundarapandian, 2020 – present
    - Sheera Shamsu, 2019 – present
- Master’s Students
    - Deepali Ande, MS, 2020 – present
    - Sumit Padhiyar, MS, 2019 – 2021
    - Shashank Shekhar Dubey, MS, 2019 – 2021
    - Atul Dhiman, MTech, 2019 – 2020
- Undergraduate Students
    - Anirudh Sunder Raj, Dual Degree Project, 2020 – present
    - Arnhav Datar, UGRC, 2021
    - Matevz Polijanc, Part II, University of Cambridge, 2017 – 2018
    - Charlie Crisp, Part II, University of Cambridge, 2017 – 2018
    - Henry Mercer, Part II, University of Cambridge, 2017 – 2018
    - Matt Harrison, Part II, University of Cambridge, 2016 – 2017
    - James Wright, Part II, University of Cambridge, 2015 – 2016
- Project Staff
    - Sudha Parimala, RSDE, IITM, 2019 – 2021
    - Shubham Kumar, RSDE, IITM, 2019 – 2021
    - Shakthi Kannan, RSDE, IITM, 2020 – 2021
    - Shubhendra Singhal, RSDE, IITM, 2020 – 2021
    - Anmol Sahoo, RSDE, IITM, 2019 – 2020
- Interns

- Aadharsh Kamath, NITK, 2021
- Shagun Goel, Stanford University, 2020
- Pratap Singh, Harvard University, 2019
- Nicolas Assouad, ENS Paris, 2017
- Maxime Lesourd, ENS Lyon, 2017
- Philip Dexter, Binghampton University, 2016
- Armael Gueneau, ENS Lyon, 2016
- Theo Laurent, ENS Lyon, 2015
- Guillain Potron, ENS Lyon, 2015