Curriculum Vitae

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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

Awards and Recognitions

- Invited keynote speaker at ICFP 2022.
- Distinguished paper at PADL 2021.
- Distinguished paper award at ICFP 2020.
- Class of 1991 Award for Young Faculty in Computer Science and Engineering, IIT Madras, 2019.

- Research Fellowship, Royal Commission for the Exhibition of 1851, 2015–2018.
- Research Fellowship, Darwin College, Cambridge, 2015–2018.
- Maurice H. Halstead Memorial Award for outstanding research in Software Engineering, Purdue University, 2014.
- Best paper award at Many-core Architecture Research Symposium at RWTH-Aachen, 2012.
- SIGPLAN PAC travel grant for PLDI 2012 and POPL 2014.
- NSF travel grant for ICFP 2013.

❖ Grants

- PI, Multicore Support for Tezos blockchain, Tezos Foundation, 2019 – 2023, £194,000.
- PI, Qilin: Scalable Concurrent Unikernels with Effect Handlers, IIT Madras, 2019 – 2021, INR 500,000.
- Co-I, Feasibility of an Operating System for Interspatial Networking in a Built Environment, Centre for Digital Built Britain (CDBB), 2018, £24,000.
- PI, Quelea: Safe Declarative Programming over Heterogeneous Parallel Systems, Royal Commission for the Exhibition of 1851, 2015–2018, £102,000.

❖ 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**: PaPoC 2022, ML Workshop 2019.
- **Program Committee member**: PLDI 2023, ML Workshop 2022, OCaml Workshop 2022, 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

- Technical Committee Member, Department of School Education, Government of Tamil Nadu, 2020 – 2022.
- Board Member, Industrial Consultancy and Sponsored Research (ICSR), IIT Madras, 2021 – 2023.
- 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

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

❖ Journal Publications

Retrofitting Parallelism onto OCaml *Aug 2020*
J9 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

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

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

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

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

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

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
IEEE Data Engineering Bulletin, 39(1): 52 – 64

MultiMLton: A Multicore-aware Runtime for Standard ML *Nov 2014*
J2 KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
Journal of Functional Programming (JFP), 24(6): 613 – 674

Efficient Sessions *Feb 2013*
J1 KC Sivaramakrishnan, Mohammad Qudeisat, Lukasz Ziarek, Karthik Nagaraj, Patrick Eugster
Science of Computer Programming (SCP), 78(2): 147 – 167

❖ Conference Publications

Certified Mergeable Replicated Datatypes *Jun 2022*
C15 Vimala Soundarapandian, Adharsh Kamath, Kartik Nagar, KC Sivaramakrishnan
International Conference on Programming Language Design and Implementation (PLDI), 2022

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

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

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

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

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

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

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

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*
C5 KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
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

Composing Schedulers using Effect Handlers *Sep 2022*
W21 Deepali Ande, KC Sivaramakrishnan
OCaml Workshop, 2022

Marrying Replicated and Functional Data Structures *May 2022*
W20 Vimala Soundarapandian, Adharsh Kamath, Kartik Nagar, KC Sivaramakrishnan
9th Workshop on Principles and Practice of Consistency for Distributed Data (PaPoC), 2022

W19 **Parafuzz: Coverage-guided Property Fuzzing for Multicore OCaml programs** *Aug 2021*
Sumit Padhiyar, Adharsh Kamath, KC Sivaramakrishnan
OCaml Workshop, 2021

W18 **Experiences with Effects** *Aug 2021*
Thomas Leonard, Craig Ferguson, Patrick Ferris, Sadiq Jaffer, Tom Kelly, KC Sivaramakrishnan, Anil Madhavapeddy
OCaml Workshop, 2021

W17 **Adapting the OCaml ecosystem for Multicore OCaml** *Aug 2021*
Sudha Parimala, Enguerrand Decorne, Sadiq Jaffer, Tom Kelly, KC Sivaramakrishnan
OCaml Workshop, 2021

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 Hillerström, 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, 2017

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

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 Hillerström, 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, Théo Laurent
OCaml Workshop, 2016

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

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

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

Migrating MultiMLton to the Cloud *Sep 2013*
W4 KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
ML Workshop

Scalable Lightweight Task Management Schemes for MIMD Processors *Apr 2011*
W3 Daniel G. Waddington, Chen Tian, KC Sivaramakrishnan
Workshop on Systems for Future Multi-Core Architectures (SFMA)

The Design Rationale for MultiMLton *Sep 2010*
W2 Suresh Jagannathan, Armand Navabi, KC Sivaramakrishnan, Lukasz Ziarek
ML Workshop

Lightweight Asynchrony using Parasitic Threads *Jan 2010*
W1 KC Sivaramakrishnan, Lukasz Ziarek, Raghavendra Prasad, Suresh Jagannathan
Workshop on Declarative Aspects of Multicore Programming (DAMP)

❖ Technical Reports and Drafts

Featherweight Threads for Communication *Nov 2011*
T1 KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan
Purdue University Computer Science Technical Report – TR-11-018

❖ Teaching

- Lecturer:
  - Compiler Design, IIT Madras, Monsoon ’22
  - 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