

# Curriculum Vitae

September 22, 2021

**KC Sivaramakrishnan**

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Indian Institute of Technology, Madras  
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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**

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

**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

- 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**: 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

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|----|---|----------|
| E2 | <p><a href="#">Special Issue on the Theory and Practice of Algebraic Effects and Handlers</a><br/>         KC Sivaramakrishnan, Andrej Bauer (eds.)<br/> <i>Journal of Functional Programming</i></p> | Jan 2021 |
| E1 | <p><a href="#">Algebraic Effect Handlers go Mainstream</a><br/>         KC Sivaramakrishnan, Daan Leijen, Matija Pretnar, Tom Schrijvers<br/> <i>Dagstuhl Reports, Volume 8, Issue 4, 2018</i></p>    | Apr 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 Eliopoulos, 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

## ❖ 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
- C12 [Banyan: Coordination-free Distributed Transactions over Mergeable Types](#) Dec 2020  
Shashank Shakhra 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	<b>Bounding Data Races in Space and Time</b> Stephen Dolan, KC Sivaramakrishnan, Anil Madhavapeddy <i>International Conference on Programming Language Design and Implementation (PLDI)</i>	Jun 2018
C9	<b>Continuation Passing Style for Effect Handlers</b> Daniel Hillerstrm, Sam Lindley, Robert Atkey, KC Sivaramakrishnan <i>International Conference on Formal Structures for Computation and Deduction (FSCD)</i>	Sep 2017
C8	<b>DaLi : Database as a Library</b> 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>	May 2017
C7	<b>Declarative Programming over Eventually Consistent Data Stores</b> KC Sivaramakrishnan, Gowtham Kaki, Suresh Jagannathan <i>International Conference on Programming Language Design and Implementation (PLDI)</i>	Jun 2015
C6	<b>Rx-CML: A Prescription for Safely Relaxing Synchrony</b> KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>Symposium on Practical Aspects of Declarative Languages (PADL)</i>	Jan 2014
C5	<b>A Coherent and Managed Runtime for ML on the SCC</b> KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>Many-core Architecture Research Community Symposium (MARC)</i> <b>Best paper award</b>	Nov 2012
C4	<b>Eliminating Read Barriers through Procrastination and Cleanliness</b> KC Sivaramakrishnan, Lukasz Ziarek, Suresh Jagannathan <i>International Symposium on Memory Management (ISMM)</i>	Jun 2012
C3	<b>Composable Asynchronous Events</b> Lukasz Ziarek, KC Sivaramakrishnan, Suresh Jagannathan <i>International Conference on Programming Language Design and Implementation (PLDI)</i>	Jun 2011
C2	<b>Efficient Session Type Guided Distributed Interaction</b> KC Sivaramakrishnan, Karthik Nagaraj, Lukasz Ziarek, Patrick Eugster <i>International Conference on Coordination Models and Languages (COORDINATION)</i>	June 2010
C1	<b>Partial Memoization of Concurrency and Communication</b> Lukasz Ziarek, KC Sivaramakrishnan, Suresh Jagannathan <i>International Conference on Functional Programming (ICFP)</i>	Sep 2009

## ❖ Workshop Publications

W16	<b>Certified Mergeable Replicated Data Types</b> Vimala Soundarapandian, KC Sivaramakrishnan, Kartik Nagar <i>8th Workshop on Principles and Practice of Consistency for Distributed Data (PaPoC), 2021</i>	Apr 2021
W15	<b>Handlers.js</b> Daniel Hillerstrm, Sam Lindley, Robert Atkey, KC Sivaramakrishnan, Jeremy Yallop <i>Programming Technology for the Future Web (ProWeb), 2019</i>	Apr 2018
W14	<b>An Architecture for Interspatial Communication</b> Anil Madhavapeddy, KC Sivaramakrishnan, Gemma Gordon, Thomas Gazagnaire <i>Hot Topics in Pervasive Mobile and Online Social Networking (HotPOST), 2018</i>	Apr 2018
W13	<b>A Memory Model for Multicore OCaml</b> Stephen Dolan and KC Sivaramakrishnan <i>OCaml Workshop</i>	Sep 2017

W12	<a href="#">Effectively Tackling the Awkward Squad</a> Stephen Dolan, Spiros Eliopoulos, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White <i>OCaml Workshop</i>	Sep 2017
W11	<a href="#">Mergeable Types</a> Gowtham Kaki, KC Sivaramakrishnan, Samodya Abeysiriwardane, Suresh Jagannathan <i>ML Workshop</i>	Sep 2017
W10	<a href="#">Concurrent System Programming with Effect Handlers</a> Stephen Dolan, Spiros Eliopoulos, Daniel Hillerstrm, Anil Madhavapeddy, KC Sivaramakrishnan, Leo White <i>Symposium on Trends in Functional Programming (TFP)</i>	Jun 2017
W9	<a href="#">Eff directly in OCaml</a> Oleg Kiselyov and KC Sivaramakrishnan <i>JSSST Workshop on Programming and Programming Languages</i>	Mar 2017
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

- 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, Michaelmas '15.
- Supervisions at University of Cambridge:
  - Databases, Michaelmas '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