Curriculum Vitae

Tuesday 9th June, 2026

Gowtham Kaki
1111 Engineering Dr, ECOT 717
Boulder, CO 80309, USA

https://gowthamk.github.io
gowtham.kaki@colorado.edu
+1 201 417 1775

A. Education

PhD	**Purdue University, USA**, Computer Science Advisor: Suresh Jagannathan Thesis: **Automatic Reasoning Techniques for Non-Serializable Data-Intensive Applications**	2019
M.S	**Purdue University**, Computer Science	2016
B.E (Hons.)	**Birla Institute of Technology and Science (BITS), Pilani, India**, Computer Science	2009

B. Academic and Industry Appointments

University of Colorado Boulder, USA — August 2020–present
Assistant Professor, Department of Computer Science

Purdue University, USA — January 2020–July 2020
Postdoctoral Researcher, Department of Computer Science
Advisor: Suresh Jagannathan

Purdue University, USA — August 2019–December 2019
Visiting Assistant Professor, Department of Computer Science

Microsoft Research, India — Summer 2014 & 2015
Research Intern, Advisor: G. Ramalingam

Yahoo Inc, India — July 2009–July 2011
Software Engineer, Content Platforms Group

C. Research Interests

Automatic formal methods for safety and security verification in mission-critical systems.

Keywords: Formal Methods, Programming Languages, Distributed Systems, Adversarial Networks, Cryptography, Databases, Neuro-Symbolic Reasoning, Program Synthesis

D. Awards/Honors

Professional

Amazon Research Award — 2023
Amazon Inc., USA.

Maurice H. Halstead Memorial Award for Software Engineering research 2019
Purdue University, USA.

North America PhD Fellowship 2018
Google Inc., USA

"30-under-30" Distinguished Almunus Award 2018
BITS, Pilani, India.

Award Papers

IEEE Data Engineering: Bulletin Special Issue Invitation 2016
Representation without Taxation: A Uniform, Low-Overhead, and High-Level Interface to Eventually Consistent Key-Value Stores

E. FUNDING

I have been a PI or co-PI on sponsored research totaling in awards of approximately $945,000 of which $50,000 has been led by me as PI (CU Boulder declined to accept these funds). My portion of these awards has totaled approximately $265,635. A summary of these figures is given below:

Total Awarded:	$945,000
Awarded, my portion, approximate:	$265,635
Awarded as PI for CU Boulder:	$50,000

F. ADVISING

Current PhD Thesis Advisees

1. Kirby Linvill, Fall 2021–present.
2. Christian Fontenot, Fall 2022–present.
3. Sai Lalith Kumar Aka, Fall 2025–present.
4. Kunha Kim, Fall 2025–present.

Graduated BS/MS/Phd Thesis Advisees

1. Nicholas V. Lewchenko (PhD), Fall 2021–Spring 2026, Computer Science, CU Boulder,
   Thesis Title. *A Direct Approach to Decidable Verification for Distributed Systems*.
2. Pranav Subramanian (BS), Fall 2022–Spring 2023, Computer Science, CU Boulder,
   Thesis Title. *Secko: A Distributed Content-Addressable Data Store*.
   First Employment. *Sofware Engineer*, NASA Goddard Space Flight Center.

MS/BS Research Advisees (Computer Science, CU Boulder)

1. Mayank Joshi (MS), Fall 2020–Spring 2021.
2. Saksham Srivastava (MS), co-advised with Ashutosh Trivedi, Fall 2022–Spring 2023,
3. Hemanth Nagendra (MS), Fall 2022 –Spring 2023
4. Bhoomika Singla (MS), Spring 2023 –Spring 2024
5. Richard Roberson (BS), Summer 2023– Fall 2023, Started as CU SPUR summer intern
6. Noah Schwartz (BS), Summer 2024 – Spring 2025, , Started as CU SPUR summer intern

7. Warren Fu (BS), Summer 2024 – Spring 2025, Started as CU SPUR summer intern

8. Oscar Bender-Stone (BS), Fall 2024 – present, Started as CU DLA apprentice

CU SPUR Summer Interns (non-CU)

1. AJ Lorenzo Carson, Cybersecurity, Arapahoe Community College.

2. Brian Meza, Computer Science, Community College of Aurora.

G. Publications

The names of the students whom I formally advise are underlined. Those whom I unofficially advise are indicated with a †.

Journal or Journal-Equivalent Publications

J12 **Effectively-Propositional Higher-Order Functional Programming** *Mar 2026*
Nicholas Lewchenko, Kunha Kim, Bor-Yuh Evan Chang, and **Gowtham Kaki**
Proceedings of the ACM on Programming Languages (PACMPL), issue OOPSLA1 2026
Article No.: 151; Pages: 1627 - 1653

J11 **Bolt-On Strong Consistency: Specification, Implementation, and Verification** *Oct 2025*
Nicholas Lewchenko, **Gowtham Kaki**, and Bor-Yuh Evan Chang
Proceedings of the ACM on Programming Languages (PACMPL), issue OOPSLA1 2025
Article No.: 137; Pages: 1604 - 1631; Acceptance rate: 32%

J10 **Lancet: A Formalization Framework for Crash and Exploit Pathology** *August 2025*
Qinrun Dai, Kirby Linvill, Yueqi Chen, **Gowtham Kaki**
34th USENIX Security Symposium (Security 2025)
Pages 375 - 394 (double column); Accceptance rate: 17%

J9 **Verifying Indistinguishability of Privacy-Preserving Protocols** *Oct 2023*
Kirby Linvill, **Gowtham Kaki**, and Eric Wustrow
Proceedings of the ACM on Programming Languages (PACMPL), issue OOPSLA2 2023
Article No.: 273; Pages 1442 - 1469; Acceptance rate: 38%

J8 **Historia: Refuting Callback Reachability with Message-History Logics** *Oct 2023*
Shawn Meier†, Sergio Mover, **Gowtham Kaki**, and Bor-Yuh Evan Chang
Proceedings of the ACM on Programming Languages (PACMPL), issue OOPSLA2 2023
Article No.: 289; Pages 1905 - 1934; Acceptance rate: 38%

J7 **RunTime-Assisted Convergence in Replicated Data Types** *June 2022*
Gowtham Kaki, Prasanth Prahladan†, Nicholas Lewchenko
43rd ACM SIGPLAN Programming Language Design and Implementation (PLDI 2022)
Pages 364 - 378 (double column); Accceptance rate: 20%

J6 **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
Article No.: 154; Pages 1 - 29; Acceptance rate: 36%

J5 **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
Article No.: 164; Pages 1 - 27; Acceptance rate: 28%

J4 **Alone Together: Compositional Reasoning and Inference for Weak Isolation** *Jan 2018*
Gowtham Kaki, Kartik Nagar, Mahsa Najafzadeh, Suresh Jagannathan
Proceedings of the ACM on Programming Languages (PACMPL), issue POPL 2018
Article No.: 27; Pages 1 - 34; Acceptance rate: 24%

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
Invited article; Pages 52 - 64.

J2 **Declarative Programming over Eventually Consistent Data Stores** *Jun 2015*
KC Sivaramakrishnan, **Gowtham Kaki**, Suresh Jagannathan
37th ACM SIGPLAN Programming Language Design and Implementation (PLDI 2015)
Accceptance rate: 19%

J1 **A Relational Framework for Higher-Order Shape Analysis** *Sep 2014*
Gowtham Kaki, Suresh Jagannathan
19th ACM SIGPLAN International Conference on Functional Programming (ICFP 2014)
Pages 413 - 424 (double column); Accceptance rate: 29%

Journal Pre-prints

P3 **Dissprove: Goal-Directed Verification of Parametrized Affine Actor Systems** *June 2026*
Christian Fontenot, **Gowtham Kaki**, and Bor-Yuh Evan Chang
Under the editorial process (Major Revision) at OOPSLA 2026
Full paper (25 pages)

P2 **A NUMA-aware Type Extension with Introspective Typing** *June 2026*
Kidus Workneh, Pedro Kasprzykowski, Razan Alghamdi, **Gowtham Kaki**, and Joseph Izraelevitz
Under submission to OOPSLA 2026
Full paper (25 pages)

P1 **Parameter Inference by Neural Network-Guided Elimination of Latent Variables in Ordinary Differential Equations** *June 2026*
Oscar Bender-Stone, **Gowtham Kaki**, Rebecca Morrison, and Bor-Yuh Evan Chang
Under the editorial process at Journal of Computational Physics (JCP) 2026
Full paper (25 pages)

Peer-Reviewed Conference Publications

C3 **Version Control Is For Your Data Too** *May 2019*
Gowtham Kaki, KC Sivaramakrishnan, Suresh Jagannathan
3rd Summit on Advances in Programming Languages (SNAPL 2019)
Pages 8:1 - 8:18; Accceptance rate: 57%

C2 **Safe Transferable Regions** *Jul 2018*
Gowtham Kaki, G Ramalingam
32nd European Conference on Object-Oriented Programming (ECOOP 2018)
Pages 11:1-11:31; Accceptance rate: 39%

C1 **Novel adaptive scheduling algorithm for computational grid** *Jan 2010*
Sunita Bansal, **Gowtham Kaki**, Chittaranjan Hota
IEEE Internet Multimedia Services Architecture and Applications (IMSAA 2009)
Pages: 11:1 - 11:5; Acceptance rate unknown

Peer-Reviewed Workshop Publications

W6 **Ravencheck: Effectively Propositional Reasonign for Rust** *June 2026*
Kunha Kim, Nicholas Lewchenko, Bor-Yuh Evan Chang, and **Gowtham Kaki**
ACM SIGPLAN International Wokrshop on the State of the Art in Program Anaysis (SOAP), 2026
Short paper (6 pages)

W5 **Distributed Consensus Algorithms as Replicated State Applications** *April 2023*
Nicholas Lewchenko and **Gowtham Kaki**
ACM SIGOPS Principles and Practice of Consistency for Distributed Data (PaPoC 2023)
Short paper (6 pages); Acceptance rate: 70%

W4 **Bolt-On Convergence in Mergeable Replicated Data Types** *April 2022*
Gowtham Kaki, Prasanth Prahladan†, Nicholas Lewchenko
ACM SIGOPS Principles and Practice of Consistency for Distributed Data (PaPoC 2022)
Short paper (6 pages); Acceptance rate: 73%

W3 **Fine-grained distributed consistency guarantees with effect orchestration** *Apr 2018*
Kia Rahmani, **Gowtham Kaki**, Suresh Jagannathan
ACM SIGOPS Principles and Practice of Consistency for Distributed Data (PaPoC 2018)
Short paper (6 pages); Acceptance rate: 72%

W2 **Mergeable Types** *Sep 2017*
Gowtham Kaki, KC Sivaramakrishnan, Samodya Abeysiriwardane, Suresh Jagannathan
ML Workshop (ML 2017)
Short paper (2 pages; double column); Acceptance rate unknown

W1 **DaLi : Database as a Library** *May 2017*
Gowtham Kaki, KC Sivaramakrishnan, Thomas Gazagnaire, Anil Madhavapeddy, Suresh Jagannathan
Summit on Advances in Programming Languages (SNAPL 2017)
Oral Presentation; Acceptance rate unknown.

Technical Reports

T2 **Analyzing the Effectiveness of Large Language Models on Text-to-SQL Synthesis** *Dec 2023*
Richard Roberson, **Gowtham Kaki**, and Ashutosh Trivedi
arXiv:2401.12379

T1 **Safe Memory Regions for Big Data Processing** *Jan 2016*
Gowtham Kaki, G Ramalingam, Kapil Vaswani, Dimitrios Vytiniotis
Microsoft Tech Report

H. Invited Talks

Convergence is Half Way to Consensus
Colorado State University (CSU) CS Colloquium. *Mar 2026*
AWS Identity Colloquium. *Dec 2025*
Verification of Distributed Systems (VDS) Workshop, Rabat, Morocco. *May 2025*
State of Scale @ ETH Denver Conference. *Feb 2025*

Consensus via Convergence and Monotonicity *Sep 2024*
ACM DARE Summer School, TU Darmstadt.

Verifying Indistinguishability of Privacy-Preserving Protocols
Dagstuhl Seminar on Formal Methods in Distributed Systems *Mar 2023*

MRDTs: Data Structures for Truly Decentralized Internet *Nov 2022*
IIT Madras, India

Mergeable Replicated Data Types
University of Minnesota, Twin Cities *Nov 2020*
Shonan Seminar on Programming Language Support for Data-Intensive Applications, Japan *Jul 2019*

Catalyst: A Relational Framework for Higher-Order Shape Analysis *Mar 2016*
Dagstuhl Seminar on Language-based approaches for Functiona Program Verification

I. Teaching Experience

University of Colorado Boulder:

CSCI 3155 Principles of Programming Languages Spring 2021, Spring 2022, Fall 2023, Spring 2025

CSCI 5535 & ECEN 5533 Fundamentals of Programming Languages Fall 2021, Fall 2024

Core undergraduate and graduate-level course on the fundamental ideas behind programming languages and formal verification. I re-designed the graduate curriculum to center around proof assistants.

CSCI 7000 Distributed Systems Verification Spring 2021, Spring 2024

(New) Graduate seminar on the formal verification problem for distributed systems. New course. The course curriculum was later adopted by NUS Singapore.

CSCI 7000 Advanced Functional Programming Spring 2023

(New) Graduate course teaching advanced concepts in functional programming, such as Applicatives, Monads, and Dependent Types.

Purdue University:

CS 307 Software Engineering Fall 2019

Core undergraduate-level course teaching methodical approaches to large-scale software engineering.

J. Professional Activities

- NSF Panelist: 2021, 2023, 2024.
- NSF External Reviewer: 2025.
- Computer Security Search Committee Member, 2021-2022
- Trustworthy and Scalable AI Systems Search Committee Chair, 2024-2025
- CS Department Graduate Committee Member, 2020-2022, 2024-present.
- Program Committee Chair, 12^{th} ACM SIGOPS Workshop on Principles and Practice of Consistency for Distributed Data, 2025. Co-located with EuroSys.
- Program Committee Chair, PLDI 2026 Student Research Competition.
- Program Committee Member: PaPoC 2022, OOPSLA 2022, PLDI 2023, OOPSLA 2023, PaPoC 2023, OOPSLA 2024, ATVA 2024, POPL 2025, PLDI 2026, OOPSLA 2026.
- External Reviewer: TOPLAS 2023, TOPLAS 2024, POPL 2026.
- Organizing Committee Member: OOPSLA 2023, OOPSLA 2024, PLDI 2026.

K. Domicile

Citizenship: India.
Lawful permanent resident (LPR) of the United States.