

## Education

- 2020–Present **Ph.D. in Computer Science**, *Stanford University*, Stanford, CA.  
Advised by Alex Aiken and Fredrik Kjolstad
- 2015–2019 **BS in Computer Science**, *Carnegie Mellon University*, Pittsburgh, PA.  
Advised by Umut Acar  
Dean's List, University and SCS College Honors

## Experience

- 2023–Present **Part-time Research Intern**, *NVIDIA*, Santa Clara, CA.  
  - Working on parallel programming systems.
- 2024 **Research Intern**, *NVIDIA*, Santa Clara, CA.  
  - Researching techniques to effectively program emerging GPU architectures.
- 2023 **Research Intern**, *NVIDIA*, Santa Clara, CA.  
  - Researching compilation-based techniques to compose parallel programs in the Legate framework.
- 2022 **Research Intern**, *NVIDIA*, Santa Clara, CA.  
  - Developed `legate.sparse`, a distributed and accelerated drop-in replacement for `scipy.sparse`.
- 2019–2020 **Software Engineer**, *Cockroach Labs*, New York, NY.  
  - Improved stability and performance of CockroachDB's distributed SQL engine and schema management infrastructure.
  - Contributed to development of a variety of large features in CockroachDB including ENUM types, User Defined Schemas, and Online Primary Key Changes.
- 2018 **Software Engineering Intern**, *Uber Advanced Technologies Group*, San Francisco, CA.  
  - Developed infrastructure for a migration from an internal data center to AWS.
  - Implemented a file access system within AWS for integration with existing data center services.
  - Dramatically enhanced scalability of batch compute jobs processing internal data.
- 2017 **Software Engineering Intern**, *Facebook*, Menlo Park, CA.  
  - Developed system to perform disruptive upgrades on network switches.
  - Added packet subscription service for network switch agent debugging and maintenance.

## Selected Research Projects

- 2024 **Automatic Tracing in Task-Based Runtime Systems** with *Michael Bauer, David Broman, Michael Garland, Alex Aiken, Fredrik Kjolstad*  
Developed dynamic program analyses to automatically apply the tracing optimization in task-based runtime systems, enabling significantly reduced runtime overhead at scale in complex distributed applications.
- 2023 **Composing Distributed Computations Through Task and Kernel Fusion** with *Michael Bauer, Shiv Sundram, Wonchan Lee, Michael Garland, Alex Aiken, Fredrik Kjolstad*  
Developed dynamic program analysis techniques to fuse computations across library boundaries on distributed machines, enabling applications built through the composition of high-level libraries to approach the performance of hand-written code.
- 2022 **Legate Sparse** with *Michael Bauer, Wonchan Lee, Manolis Papadakis, Melih Elibol, Michael Garland*  
Developing `legate.sparse` a distributed and GPU-accelerated drop-in replacement for `scipy.sparse`, enabling supercomputer scale performance from high-level Python code.
- 2021–2022 **Compiling Tensor Computations to Supercomputers** with *Fred Kjolstad, Alex Aiken*  
Developed DISTAL, a compiler for sparse and dense tensor algebra that targets distributed systems.
- 2020 **Automated Mapping of Computation and Data** with *Alexandra Henzinger, Thiago Teixeira, Alex Aiken*  
Developed system to automatically discover strategies for mapping computation and data onto different processors and memories in a heterogeneous system.
- 2018–2019 **Disentanglement** with *Sam Westrick, Umut Acar*  
Designed efficient memory management systems for the memory access patterns of fork-join parallel programs.

## Publications

- ASPLOS 2025 **Automatic Tracing in Task-Based Runtime Systems** *Rohan Yadav, Michael Bauer, David Broman, Michael Garland, Alex Aiken, Fredrik Kjolstad*

- ASPLOS 2025 **Composing Distributed Computations Through Task and Kernel Fusion** Rohan Yadav, Shiv Sundram, Wonchan Lee, Michael Garland, Michael Bauer, Alex Aiken, Fredrik Kjolstad
- SC 2023 **Legate Sparse: Distributed Sparse Computing in Python** Rohan Yadav, Wonchan Lee, Melih Elibol, Manolis Papadakis, Taylor Lee-Patti, Michael Garland, Alex Aiken, Fredrik Kjolstad, Michael Bauer
- SC 2023 **Automated Mapping of Task-Based Programs onto Distributed and Heterogenous Machines** Thiago S. F. X. Teixeira, Alexandra Henzinger, Rohan Yadav, Alex Aiken
- SC 2022 **SpDISTAL: Compiling Sparse Distributed Tensor Computations** Rohan Yadav, Alex Aiken, Fredrik Kjolstad
- PLDI 2022 **DISTAL: The Distributed Tensor Algebra Compiler** Rohan Yadav, Alex Aiken, Fredrik Kjolstad
- OOPLSA 2021 **Compilation of Sparse Array Programming Models** Rawn Henry, Olivia Hsu, Rohan Yadav, Stephen Chou, Kunle Olukotun, Saman Amarasinghe, Fredrik Kjolstad
- POPL 2020 **Disentanglement in Race-Free Nested Parallel Programs** Sam Westrick, Rohan Yadav, Matthew Fluet, Umut A. Acar
- Undergraduate Thesis **Disentanglement, Theory and Practice** Rohan Yadav
- SPAA 2019 **Brief Announcement: A Parallel Algorithm for Subgraph Isomorphism** Rohan Yadav, Umut A. Acar

## Awards

- 2024 Jane Street Graduate Research Fellowship (Finalist)
- 2023 NVIDIA Graduate Research Fellowship
- 2020 NSF Graduate Research Fellowship
- 2019 CRA Outstanding Undergraduate Researcher Nominee
- 2019 Carnegie Mellon Senior Leadership Recognition
- 2015 Presidential Scholar Semifinalist

## Talks

### Computing Distributed Computations Through Task and Kernel Fusion

- Charm++ Workshop 2024, April 2024

### Legate Sparse: Distributed and Accelerated Sparse Computing in Python

- SIAM Parallel Processing, March 2024
- UW PLSE Seminar, December 2023
- SC 2023, November 2023
- UIUC Compilers Seminar, October 2023
- MIT Fast Code Seminar, October 2023
- CMU Catalyst Group Meeting, October 2023
- Berkeley Programming Systems Seminar, September 2023
- Stanford HPC-AI Advisory Council, February 2023

### SpDISTAL: Compiling Sparse Distributed Tensor Computations

- Legion Retreat, December 2022
- AHA Affiliates Retreat, December 2022
- SC 2022, November 2022
- Stanford Software Research Lunch, April 2022

### DISTAL: The Distributed Tensor Algebra Compiler

- Google Research, November 2022 (Invited)
- PLDI 2022, June 2022
- Vienna University of Technology, April 2022 (Invited)
- Stanford Agile Hardware Project Group Meeting, Jan 2022
- Cerebras Systems, Dec 2021 (Invited)
- Oxford Tensor Computations Seminar, Nov 2021
- Stanford Software Research Lunch, Nov 2021

### On the Automated Mapping of Computation and Data Onto Heterogenous Machines

- Stanford Software Research Lunch, Feb 2021
- Legion Developer Meeting, Jan 2021

### A Parallel Algorithm for Subgraph Isomorphism

- SPAA 2019, Jun 2019

## **Disentanglement, Theory and Practice**

- CMU Meeting of the Minds, May 2019

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## Teaching

2023 **Teaching Assistant** *Stanford CS143* Compilers

2021-2022 **Teaching Assistant** *Stanford CS242* Programming Languages

2017-2018 **Head Teaching Assistant** *CMU 15210* Parallel Algorithms and Data Structures

2016 **Teaching Assistant** *CMU 15150* Functional Programming

2018-2020 **Diderot**

Developed and maintained a new course management platform, now used by 1500 students daily at CMU.