#### 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.
  - o Researching techniques to effectively program emerging GPU architectures.
- 2023 Research Intern, NVIDIA, Santa Clara, CA.
  - o Researching compilation-based techniques to compose parallel programs in the Legate framework.
- 2022 Research Intern, NVIDIA, Santa Clara, CA.
  - o Developed legate.sparse, a distributed and accelerated drop-in replacement for scipy.sparse.
- 2019-2020 **Software Engineer**, Cockroach Labs, New York, NY.
  - o 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.
    - o Implemented a file access system within AWS for integration with existing data center services.
    - o Dramatically enhanced scalability of batch compute jobs processing internal data.
  - 2017 **Software Engineering Intern**, Facebook, Menlo Park, CA.
    - o Developed system to perform disruptive upgrades on network switches.
    - o 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 heterogenous 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 Compilation of Sparse Array Programming Models Rawn Henry, Olivia Hsu, Rohan Yadav, Stephen Chou,
      - 2021 Kunle Olukotun, Saman Amarasinghe, Fredrik Kjolstad
  - POPL 2020 Disentanglement in Race-Free Nested Parallel Programs Sam Westrick, Rohan Yadav, Matthew Fluet, Umut A. Acar

Thesis

Undergraduate 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

o Charm++ Workshop 2024, April 2024

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

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

#### SpDISTAL: Compiling Sparse Distributed Tensor Computations

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

## **DISTAL: The Distributed Tensor Algebra Compiler**

- o Google Research, November 2022 (Invited)
- o PLDI 2022, June 2022
- Vienna University of Technology, April 2022 (Invited)
- o Stanford Agile Hardware Project Group Meeting, Jan 2022
- o 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

o SPAA 2019, Jun 2019

## Disentanglement, Theory and Practice

 $_{\rm O}$  CMU Meeting of the Minds, May 2019

# 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.