

Sam Westrick

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Employment

2022– **Post Doctoral Fellow**, *Computer Science Department*, Carnegie Mellon University, Pittsburgh, PA

2015–2016 **Research Associate**, *Carnegie Mellon University*, Pittsburgh, PA

○ Supervised by Umut A. Acar

Education

2016–2022 **Ph.D.**, *Computer Science Department*, Carnegie Mellon University, Pittsburgh, PA

○ Advised by Umut A. Acar

2011–2015 **B.S. in Computer Science**, *Carnegie Mellon University*, Pittsburgh, PA

○ University Honors; 3.75 GPA

Doctoral Dissertation

Aug 2022 **Efficient and Scalable Parallel Functional Programming Through Disentanglement**

Carnegie Mellon University, Pittsburgh, PA

Committee: Umut A. Acar (chair), Guy E. Blelloch, Jan Hoffman, Matthew Fluet, Alex Aiken

ACM SIGPLAN Dissertation Award

Awards and Honors

2023 ACM SIGPLAN John C. Reynolds Dissertation Award

2022 Distinguished Paper Award at the *ACM SIGPLAN International Conference on Functional Programming* (ICFP)

2021 Distinguished Paper Award at the *ACM SIGPLAN Symposium on Principles of Programming Languages* (POPL)

2015 Inducted into Phi Beta Kappa Honor Society

2015 Senior Leadership Award, Carnegie Mellon University

2011, 2012 Dean's List, Carnegie Mellon University

Peer-Reviewed Publications

- POPL'24 **Automatic Parallelism Management**
Sam Westrick, Matthew Fluet, Mike Rainey, and Umut A. Acar
- POPL'24 **DisLog: A Separation Logic for Disentanglement**
Alexandre Moine, *Sam Westrick*, and Stephanie Balzer
- PLDI'23 **Efficient Parallel Functional Programming with Effects**
Jatin Arora, *Sam Westrick*, and Umut A. Acar
- CGO'23 **WARDen: Specializing Cache Coherence for High-Level Parallel Languages**
Michael Wilkins, *Sam Westrick*, Vijay Kandiah, Alex Bernat, Brian Suchy, Enrico Armenio Deiana, Simone Campanoni, Umut A. Acar, Peter Dinda, and Nikos Hardavellas
- ICFP'22 **Entanglement Detection With Near-Zero Cost**
Sam Westrick, Jatin Arora, and Umut A. Acar
Distinguished Paper
- PPoPP'22 **Parallel Block-Delayed Sequences**
Sam Westrick, Mike Rainey, Daniel Anderson, and Guy E. Blelloch
- POPL'21 **Provably Space-Efficient Parallel Functional Programming**
Jatin Arora, *Sam Westrick*, and Umut A. Acar
Distinguished Paper
- ESA'20 **Parallel Batch-Dynamic Trees via Change Propagation**
Umut A. Acar, Daniel Anderson, Guy E. Blelloch, Laxman Dhulipala, and *Sam Westrick*
- POPL'20 **Disentanglement in Nested-Parallel Programs**
Sam Westrick, Rohan Yadav, Matthew Fluet, and Umut A. Acar
- ICFP'19 **Fairness in Responsive Parallelism**
Stefan K. Muller, *Sam Westrick*, and Umut A. Acar
- PPoPP'18 **Hierarchical Memory Management for Mutable State**
Adrien Guatto, *Sam Westrick*, Ram Raghunathan, Umut A. Acar, and Matthew Fluet
- SPAA'17 **Brief Announcement: Parallel Dynamic Tree Contraction via Self-Adjusting Computation**
Umut A. Acar, Vitaly Aksenov, and *Sam Westrick*

Submitted for Publication (Under Review)

- Nov 2023 **Hybrid CPU-GPU Task Parallelism**
Sam Westrick, Troels Henriksen, Sanil Rao, and Umut A. Acar
- Nov 2023 **Efficient Optimization of Quantum Circuits via Local Optimality**
Jatin Arora, *Sam Westrick*, Dantong Li, Yongshan Ding, and Umut A. Acar

Preprints and Papers in Preparation

- Dec 2023 **GraFeyn: Efficient Sparse-Aware Simulation of Quantum Circuits**
Sam Westrick, Byeongjee Kang, Mike Rainey, Colin McDonald, Pengyu Liu, Mingkuan Xu, Jatin Arora, Yongshan Ding, and Umut A. Acar
- Dec 2023 **Elastic Task Scheduling**
Yue Yao, *Sam Westrick*, Mike Rainey, and Umut A. Acar
- Apr 2022 **DePa: Simple, Provably Efficient, and Practical Order Maintenance for Task Parallelism**
Sam Westrick, Larry Wang, and Umut A. Acar

Invited Keynote Presentations

- Sep 2022 **Efficient and Scalable Parallel Functional Programming Through Disentanglement**, *ML Workshop*, Ljubljana, Slovenia.

Invited Talks

- Sep 2023 **How to Thrive as a Ph.D. Student**, *Programming Languages Mentoring Workshop*, Seattle, WA
- Sep 2022 **How to Thrive as a Ph.D. Student**, *Programming Languages Mentoring Workshop*, Ljubljana, Slovenia
- Apr 2022 **Efficient and Scalable Parallel Functional Programming Through Disentanglement**, *Cornell University*, Ithaca, NY
- Mar 2022 **Efficient and Scalable Parallel Functional Programming Through Disentanglement**, *Stanford University*, Stanford, CA
- Mar 2021 **Disentanglement: Provably Efficient Parallel Functional Programming**, *MIT Fast Code Seminar*, Massachusetts Institute of Technology, Cambridge, MA
- Mar 2021 **Disentangled Parallel Algorithm Design**, *PLunch (Principles of Programming Research Group Lunch)*, Carnegie Mellon University, Pittsburgh, PA
- Mar 2020 **Disentanglement in Nested-Parallel Programs**, *CSD Open House*, Carnegie Mellon University, Pittsburgh, PA
- Sep 2019 **Disentanglement in Race-Free Nested-Parallel Programs**, *PLunch (Principles of Programming Research Group Lunch)*, Carnegie Mellon University, Pittsburgh, PA
- Jun 2019 **Efficient Parallel Functional Programming with Hierarchical Memory Management**, *Rochester Institute of Technology*, Rochester, NY
- Sep 2017 **The Parallel ML Project**, *Parlay Research Seminar*, Massachusetts Institute of Technology, Cambridge, MA

Mentorship

- 2019–2020 **Lawrence Wang**, undergraduate research

- 2018–2019 **Rohan Yadav**, undergraduate research and thesis
(now PhD student at Stanford)
- 2018–2020 **Yue Yao**, master's thesis
(now PhD student at CMU)
- 2018 **Yifan Qiao**, CMU Summer intern
(now PhD student at UCLA)

Teaching Experience

- 2023 **Assistant**, 15-898: *Quantum Computer Systems*, Carnegie Mellon University, Pittsburgh, PA
- Delivered guest lectures
 - Advised student-led research
- 2022 **Assistant**, 15-897: *Advanced Topics in Parallelism and Concurrency*, Carnegie Mellon University, Pittsburgh, PA
- Helped develop course materials
 - Advised student-led research
- 2013–2020 **Teaching Assistant and Head Teaching Assistant**, 15-210: *Parallel and Sequential Data Structures and Algorithms*, Carnegie Mellon University, Pittsburgh, PA
- TA for 9 semesters, including 2 semesters as head TA
 - Managed a team of 15 undergraduate TAs
 - Designed and implemented homework assignments and recitation materials
 - Delivered weekly lectures and recitations
- 2013–2014 **Teaching Assistant**, 15-122: *Principles of Imperative Computation*, Carnegie Mellon University, Pittsburgh, PA
- TA for 4 summer sessions
 - Designed and implemented homework assignments and recitation materials
 - Delivered daily review lectures

Professional Service

- 2023 **Organizer and Co-Chair**, *ACM SIGPLAN International Workshop on Functional High-Performance and Numerical Computing (FHPNC)*, Seattle, WA
- 2023 **Artifact Evaluation Committee**, *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, Orlando, FL
- 2023 **External Reviewer**, *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, Orlando, FL
- 2017–2018 **Organizer**, *Parallelism Reading Group*, Carnegie Mellon University, Pittsburgh, PA

References

Umut A. Acar (umut@cs.cmu.edu)
Associate Professor, Computer Science Department
Carnegie Mellon University

Guy E. Blelloch (guyb@cs.cmu.edu)
Professor, Computer Science Department
Carnegie Mellon University

Alex Aiken (aaiken@stanford.edu)
Alcatel-Lucent Professor of Computer Science
Stanford University

Yongshan Ding (yongshan.ding@yale.edu)
Assistant Professor of Computer Science
Yale University