

EDUCATION

Aug. 2014 – Nov. 2019, PH.D. in Computer Science, Carnegie Mellon University

- Advisor: Prof. Guy Blelloch
- Thesis: Join-based Parallel Balanced Binary Trees

Aug. 2010 – Jul. 2014, Bachelor's in Computer Science, Tsinghua University

- Best Bachelor Thesis Award
- Graduated with honors

EMPLOYMENT

Jan. 2020 - Present, Assistant Professor at University of California, Riverside

Assistant Professor in the Department of Computer Science and Engineering

Aug. 2014 – Oct. 2019, Research Assistant at Carnegie Mellon University

Supervised by Prof. Guy Blelloch.

Jul. 2013 – Sept. 2013, Summer Research Intern at Complex Networks Lab, Department of Computer Science and Engineering, Notre Dame University

Supervised by Prof. Tijana Milenkovic.

PUBLICATIONS

For certain papers, the authors (or all but the first author) are listed alphabetically.

You can also find my publication list on [\[dblp\]](#) and [\[Google Scholar\]](#) pages.

*UCR students are in **bold**. underlined: UCR graduate student. *: UCR undergraduate student*

Conference and Journal Papers

[29] **Parallel Strong Connectivity Based on Faster Reachability (To Appear)**

Letong Wang, XiaoJun Dong, Yan Gu, and Yihan Sun

ACM Special Interest Group on Management of Data (SIGMOD), 2023.

[28] **Provably Fast and Space-Efficient Parallel Biconnectivity**

XiaoJun Dong, Letong Wang, Yan Gu, and Yihan Sun

ACM Symposium on Principles and Practice of Parallel Programming (PPoPP), 2023.

Also, arXiv:2301.01356.

Best Paper Award.

[27] **Bi-directional Lot-Structured Merge Tree**

Xin Zhang, Qizhong Mao, Ahmed Eldawy, Vagelis Hristidis, Yihan Sun

International Conference on Scientific and Statistical Database Management (SSDBM), 2022.

[26] **Parallel Cover Trees and their Applications**

Yan Gu, **Zachary Napier***, Yihan Sun, and **Letong Wang**

ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2022.

[25] **Many Sequential Iterative Algorithms Can Be Parallel and (Nearly) Work-efficient**

Zheqi Shen, Zijin Wan*, Yan Gu, and Yihan Sun

ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2022.
Also, ArXiv:2205.13077

[24] Joinable Parallel Balanced Binary Trees

Guy Blelloch, Daniel Ferizovic and Yihan Sun
ACM Transactions on Parallel Computing (TOPC), 9, 2, Article 7 (June 2022).

[23] POSTER: The Problem-Based Benchmark Suite (PBBS), V2

Daniel Anderson, Guy E. Blelloch, Laxman Dhulipala, Magdalen Dobson, and Yihan Sun
ACM Symposium on Principles and Practice of Parallel Programming (PPoPP), 2022.

[22] PaC-trees: Supporting Parallel and Compressed Purely-Functional Collections

Laxman Dhulipala, Guy E. Blelloch, Yan Gu and Yihan Sun
ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2022.
Also, ArXiv:2204.06077

[21] Analysis of Work-Stealing and Parallel Cache Complexity

Yan Gu, **Zachary Napier***, and Yihan Sun
ACM-SIAM Algorithmic Principles of Computer Systems (APOCS), 2022.

[20] Space and Time Bounded Multiversion Garbage Collection

Naama Ben-David, Guy E. Blelloch, Panagiota Fatourou, Eric Ruppert, Yihan Sun and Yuanhao Wei
International Symposium on Distributed Computing (DISC), 2021.
Also: ArXiv:2108.02775

[19] Efficient Stepping Algorithms and Implementations for Parallel Shortest Paths

Xiaoju Dong*, Yan Gu, Yihan Sun and Yunming Zhang
ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2021.
Also, ArXiv:2105.06145

[18] Constant-Time Snapshots with Applications to Concurrent Data Structures

Yuanhao Wei, Naama Ben-David, Guy E. Blelloch, Panagiota Fatourou, Eric Ruppert and Yihan Sun
ACM Symposium on Principles and Practice of Parallel Programming (PPoPP), 2021.
Also, ArXiv:2007.02372.

[17] Randomized Incremental Convex Hull is Highly Parallel

Guy E. Blelloch, Yan Gu, Julian Shun and Yihan Sun
ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2020.

[16] Optimal (Randomized) Parallel Algorithms in the Binary-Forking Model

Guy E. Blelloch, Jeremy Fineman, Yan Gu, and Yihan Sun
ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2020.
Best paper nomination.

[15] Parallelism in Randomized Incremental Algorithms

Guy E. Blelloch, Yan Gu, Julian Shun and Yihan Sun
Journal of the ACM (JACM).

[14] On Supporting Efficient Snapshot Isolation for Hybrid Workloads with Multi-Versioned Indexes

Yihan Sun, Guy E. Blelloch, Wan Shen Lim and Andrew Pavlo
Proceedings of the VLDB Endowment (PVLDB), 13(2), 2020

[13] Multiversion Concurrency with Bounded Delay and Precise Garbage Collection

Naama Ben-David, Guy E. Blelloch, Yihan Sun and Yuanhao Wei
ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2019.

Also, ArXiv:1803.08617 [cs.DC]

[12] Parallel Range, Segment and Rectangle Queries with Augmented Maps

Yihan Sun and Guy E. Blelloch

Algorithm Engineering and Experiments (*ALENEX*), 2019.

Also, ArXiv:1803.08621 [cs.CG]

[11] Algorithmic Building Blocks for Asymmetric Memories

Yan Gu, Yihan Sun and Guy E. Blelloch

European Symposium on Algorithms (*ESA*), 2018.

Also, arXiv:1806.10370 [cs.DS]

[10] Parallel Write-efficient Algorithms and Data Structures for Computational Geometry

Guy E. Blelloch, Yan Gu, Julian Shun and Yihan Sun

ACM Symposium on Parallelism in Algorithms and Architectures (*SPAA*), 2018.

Also, arXiv:1805.05592 [cs.DS]

[9] PAM: Parallel Augmented Maps

Yihan Sun, Daniel Ferizovic and Guy E. Blelloch

ACM Symposium on Principles and Practice of Parallel Programming (*PPoPP*), 2018.

Also, arXiv:1612.05665 [cs.DS]

[8] Efficient Construction of Probabilistic Tree Embeddings

Guy E. Blelloch, Yan Gu and Yihan Sun

International Colloquium on Automata, Languages, and Programming (*ICALP*), 2017.

Also, arXiv:1605.04651 [cs.DS]

[7] Just Join for Parallel Ordered Sets

Guy E. Blelloch, Daniel Ferizovic and Yihan Sun

ACM Symposium on Parallelism in Algorithms and Architectures (*SPAA*), 2016.

Also, arXiv:1602.02120 [cs.DS]

[6] Parallel Shortest-paths Using Radius Stepping

Guy E. Blelloch, Yan Gu, Yihan Sun and Kanat Tangwongsan

ACM Symposium on Parallelism in Algorithms and Architectures (*SPAA*), 2016.

Also, arXiv:1602.03881 [cs.DS]

[5] Parallelism in Randomized Incremental Algorithms

Guy E. Blelloch, Yan Gu, Julian Shun and Yihan Sun

ACM Symposium on Parallelism in Algorithms and Architectures (*SPAA*), 2016.

[4] Simultaneous Optimization of Both Node and Edge Conservation in Network Alignment via WAVE

Yihan Sun, Joseph Crawford, Jie Tang and Tijana Milenkovic

Workshop on Algorithms in Bioinformatics (*WABI*), 2015.

Also, arXiv:1410.3301 [q-bio.MN]

[3] A Top-down Parallel Semisort

Yan Gu, Julian Shun, Yihan Sun and Guy E. Blelloch

ACM Symposium on Parallelism in Algorithms and Architectures (*SPAA*), 2015.

[2] Fair Evaluation of Global Network Aligners

Joseph Crawford, Yihan Sun and Tijana Milenkovic

Algorithms for Molecular Biology, 10:19.

Poster in ACM Conference on Bioinformatics, Computational Biology and Health Informatics (*BCB*), 2015.

Also, arXiv:1407.4824 [q-bio.MN]

- [1] Influence Maximization in Dynamic Social Networks**
Honglei Zhuang, Yihan Sun, Jie Tang, Jialin Zhang and Xiaoming Sun
IEEE International Conference on Data Mining (*ICDM*), 2013.

Tutorial

- [2] Implementing Parallel Tree Structure in Shared-memory**
Yihan Sun
Tutorial in ACM Symposium on Parallelism in Algorithms and Architectures (*SPAA*), 2020.
- [1] Parallel and Concurrent Tree Structures**
Yihan Sun and Guy E. Blelloch
Tutorial in Principles and Practice of Parallel Programming (*PPoPP*), 2019.

GRANTS

AF: Small: New Directions for Parallel Data Structures (CCF-2103483, PI)

- PI: **Yihan Sun**. Co-PI: Yan Gu.
- Period: 07/15/2021 – 06/30/2024
- Total amount: \$515,749. Amount to Candidate: \$257,874.

III: Small: Rethinking the Data Organization and Lifecycle in LSM Storage Systems (IIS-2227669, co-PI)

- PI: Evangelos Christidis. Co-PI: **Yihan Sun**.
- Period: 01/01/2023 – 12/31/2025.
- Total amount: \$600,000. Amount to Candidate: \$300,000.

CAREER: Parallel Algorithms: Theory for Practice (CCF-2238358, PI)

- PI: **Yihan Sun**.
- Period: 03/01/2023 – 03/01/2028.
- Total amount: \$546,613. Amount to Candidate: \$546,613.

UCR Regents' Faculty Fellowships: Parallel Data Structures: Theory and Practice (PI)

- PI: **Yihan Sun**.
- Period: 05/07/2023 – 06/30/2024.
- Total amount: \$9,000. Amount to Candidate: \$9,000.

Collaborative Research: SHF: Medium: Functional Data Structures for Practical Large-Scale Shared-Memory Computing (co-PI). Under review.

- Guy Blelloch (PI), Carnegie Mellon University. Laxman Dhulipala (PI), University of Maryland, College Park. Yan Gu (PI), University of California, Riverside. **Yihan Sun** (co-PI), University of California, Riverside

GRANT-PROPOSAL REVIEW PANELISTS

- NSF Panel, 2020
- Two NSF Panels, 2022

AWARDS & HONORS

- **Best paper Award.** Provably Fast and Space-Efficient Parallel Biconnectivity. Xiaojun Dong, Letong Wang, Yan Gu, and Yihan Sun. ACM Symposium on Principles and Practice of Parallel Programming (PPoPP), 2023.

- **Best paper nomination.** Optimal (Randomized) Parallel Algorithms in the Binary-Forking Model. Guy E. Blelloch, Jeremy Fineman, Yan Gu, and Yihan Sun. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2020.
- Selected Participant of *Rising Stars in EECS: An Academic Career Workshop for Women*, MIT, 2018
- Graduated with Honors in Computer Science (Tsinghua Univ.), 2014
- Best Bachelor Thesis Award in Tsinghua Univ., 2014 (1st place in Computer Science)
- Outstanding Student in Beijing (2014)

SELECTED TALKS

Parallelize Sequential Iterative Algorithms and the Longest Increasing Subsequence

- **Interdisciplinary Center for Quantitative Modeling in Biology (ICQMB).** Dec. 2022. UC Riverside.

Parallelize Sequential Iterative Algorithms

- **Blelloch Fest.** Oct. 2022. Carnegie Mellon University.

PaC-trees: Supporting Parallel and Compressed Purely-Functional Collections

- **Conference talk.** Jun. 2022. San Diego, USA. ACM International Conference on Programming Language Design and Implementation (PLDI), 2022.

Efficient Stepping Algorithms and Implementations for Parallel Shortest Paths

- **Dagstuhl Workshop.** Mar. 2021. Virtual.

Randomized Incremental Convex Hull is Highly Parallel

- **Conference talk.** Sept. 2020. Virtual. International Conference on Very Large Data Bases (VLDB), 2020.

Implementing Parallel Tree Structure in Shared-Memory

- **Conference tutorial session.** Jul. 2020. Virtual. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2020.

On Supporting Efficient Snapshot Isolation for Hybrid Workloads with Multi-Versioned Indexes

- **Conference talk.** Jul. 2020. Virtual. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2020.

Join-based Parallel Balanced Binary Trees

- **Thesis oral.** Oct. 2019. Carnegie Mellon University.
- **Invited talk.** Apr. 2019. University of Connecticut.
- **Invited talk.** Apr. 2019. Pennsylvania State University.
- **Invited talk.** Mar. 2019. Georgia Institute of Technology.
- **Invited talk.** Mar. 2019. University of California, Riverside.
- **Invited talk.** Mar. 2019. Michigan State University.
- **Invited talk.** Feb. 2019. Lehigh University.
- **Invited talk.** Feb. 2019. Florida State University.
- **Invited talk.** Feb. 2019. Missouri University of Science and Technology.
- **Invited talk.** Oct. 2018. Massachusetts Institute of Technology (MIT).

Parallel and Concurrent Tree Structures

- **Conference tutorial session.** Feb. 2019. Washington, DC. Tutorial in Principles and Practice of Parallel Programming (PPoPP) 2019.

Parallel Range, Segment and Rectangle Queries with Augmented Maps

- **Conference talk.** Jan. 2019. San Diego, CA. Algorithm Engineering and Experiments (ALENEX), 2019.

On Supporting Efficient Snapshot Isolation for Hybrid Workloads with Multi-Versioned Indexes

- **Invited talk. Nov. 2018.** Carnegie Mellon University (CMU). DB seminar.

Parallel Balanced Binary Trees Using Just Join

- **Invited talk. Mar. 2018.** Goethe-University Frankfurt, Germany.
- **Thesis Proposal. Dec. 2017.** Carnegie Mellon University (CMU).

PAM: Parallel Augmented Maps

- **Conference talk. Feb. 2018.** Vienna, Austria. ACM Principles and Practice of Parallel Programming (PPoPP), 2018.
- **Sep. 2017.** Massachusetts Institute of Technology (MIT). Annual Parlay Meeting.

Just Join for Parallel Ordered Sets

- **Invited talk. Jul. 2017.** Fudan University, Shanghai, China.
- **Dec. 2016.** Carnegie Mellon University (CMU). Speaking Skill Talk.
- **Nov. 2016.** Carnegie Mellon University (CMU). Theory Lunch Talk.
- **Conference talk. Jul. 2016.** Asilomar State Beach, California, USA. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2016.
- **Apr. 2016.** Carnegie Mellon University (CMU). Annual Parlay Meeting.

A Top-down Parallel Semisort

- **Conference talk. Jun. 2015.** Portland, Oregon, USA. ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2015.

TEACHING

Courses Teaching

The "Overall Rating" is the rating of Question 18 ("The course overall as a learning experience was excellent") in iEval.

The "Effectiveness Rating" is the rating of Question ("Instructor was effective as a teacher overall") in iEval.

- **UCR CS260: Parallel Algorithms** (Winter 2020)
Graduate seminar course. Overall Rating: 4.67/5.00. Effectiveness Rating: 4.75/5.00.
- **UCR CS141: Intermediate Data Structures and Algorithms** (Fall 2020)
Upper-division undergraduate course. Rating: 4.18/5.00. Effectiveness Rating: 4.29/5.00.
- **UCR CS218: Design and Analysis of Algorithms** (Winter 2021)
Tier-1 graduate course. Rating: 4.67/5.00. Effectiveness Rating: 4.92/5.00.
- **UCR CS214: Parallel Algorithms** (Spring 2021)
Tier-1 graduate course. Rating: 4.28/5.00. Effectiveness Rating: 4.44/5.00.
- **UCR CS141: Intermediate Data Structures and Algorithms** (Fall 2021)
Upper-division undergraduate course. Rating: 3.92/5.00. Effectiveness Rating: 3.95/5.00.
- **UCR CS214: Parallel Algorithms** (Winter 2022)
Tier-1 graduate course. Rating: 4.48/5.00. Effectiveness Rating: 4.37/5.00.
- **UCR CS218: Design and Analysis of Algorithms** (Spring 2022)
Tier-1 graduate course. Rating: 4.8/5.00. Effectiveness Rating: 4.8/5.00.
- **UCR CS141: Intermediate Data Structures and Algorithms** (Fall 2022)
Upper-division undergraduate course. Rating: 4.32/5.00. Effectiveness Rating: 4.28/5.00.

Guest Lectures

- Parallel Algorithms on Balanced Binary Trees
At **CMU 15-859: Algorithms in the "Real World"** (Spring 2018)
- A Top-down Parallel Semisort

At MIT 6.886: *Algorithm Engineering* (Spring 2019)

- Parallel Algorithms on Balanced Binary Trees

At MIT 6.886: *Algorithm Engineering* (Spring 2019)

STUDENT MENTORING

Ph.D. students

- **Xiaojun Dong** (09/2020 – present, co-advised with Prof. Yan Gu)
- **Letong Wang** (09/2020 – present)
- **Yunshu Wu** (09/2020 – 02/2022)
- **Ziyang Men** (09/2022 - present)
- **Youzhe Liu** (09/2022 - present)

Master Students

- **Jiawen Lai** (09/2020 - 03/2021, now working at TikTok USA)
- **Zhongqi Wang** (07/2020 – present, Master’s Project advisor, now a Ph.D. student at University of Maryland, College Park)
- **Longze Su** (09/2020 – 03/2021, Master’s Project advisor)
- **Haide He** (09/2020 – 06/2021, Master’s Project advisor)
- **Daniel Li** (from Spring 2022)
- **Qun Lou** (05/2022 – 09/2022)
- **Brooke Godinez** (from Fall 2022)

Undergraduate Students

- **Xiaojun Dong** (12/2009 – 08/2020, now a Ph.D. student at UCR, co-advised with Yan Gu)
- **Yunshu Wu** (12/2009 – 08/2020, now a Ph.D. student at UCR)
- **Zachary Napier** (01/2021 – 08/2022, co-advised with Yan Gu)
- **Yuta Nakamura** (03/2021 – 04/2023, co-advised with Yan Gu)
- **Zijin Wan** (12/2021 – 08/2022, co-advised with Yan Gu, now a Ph.D. student at UCR)

Other student proposal/defense/exam committee member:

- **Yeja Liu** (Ph.D. oral exam, 03/2023)
- **Pengfei Li** (Ph.D. oral exam, 09/2022)
- **Yongyi Liu** (Ph.D. oral exam, 05/2022)
- **Abenezer Wudenhe** (Ph.D. oral exam, 06/2021)
- **Xin Zhang** (Ph.D. qualifying exam, 04/2021)
- **Anish Sekar** (Master thesis, 12/2020)
- **Irem Ergun** (Ph.D. oral exam, 09/2020)

DEPARTMENT SERVICES

Outreach, Alumni & Careers Committee in CS&E Department. 2020-2021.

Graduate Committee in CS&E Department. 2021-present.

Teaching Assistant Committee in CS&E Department. 2022-present.

Graduate Admission Committee in CS&E Department. 2022-present.

OTHER SERVICES

Program Committee Members:

- **ICPP** (International Conference on Parallel Processing), 2023.

- **ICS** (ACM International Conference on Supercomputing), 2023.
- **IPDPS-GrAPL Workshop** (Workshop on Graphs, Architectures, Programming, and Learning), 2023.
- **SPAA** (Symposium on Parallelism in Algorithms and Architectures), 2023.
- **SPAA** (Symposium on Parallelism in Algorithms and Architectures), 2022.
- **SEA** (Symposium on Experimental Algorithms), 2022.
- **Euro-Par** (International European Conference on Parallel and Distributed Computing), 2022.
- **PPoPP** (ACM Symposium on Principles and Practice of Parallel Programming), 2022.
- **ESA** (European Symposium on Algorithms), Track B, 2021.
- **ACDA** (SIAM Conference on Applied and Computational Discrete Algorithms), 2021.
- **Euro-Par** (International European Conference on Parallel and Distributed Computing), 2021.
- **SPAA** (Symposium on Parallelism in Algorithms and Architectures), 2021.
- **ALLENEX** (Algorithm Engineering and Experiments), 2020.
- **SPAA** (Symposium on Parallelism in Algorithms and Architectures), 2020.
- **ESA** (European Symposium on Algorithms), Track B, 2020.
- **HiPC** (IEEE International Conference on High Performance Computing, Data, And Analytics), Algorithm Track, 2020.

Other Paper reviews

Journals:

- **JEA** (Journal of Experimental Algorithmics).
- **TOPC** (ACM Transactions on Parallel Computing)
- **PARCO** (Parallel Computing, Systems & Applications).
- **JCST** (Journal of Computer Science & Technology).
- Computational Social Networks

Conferences:

- **SODA** (ACM-SIAM Symposium on Discrete Algorithms) 2021,2022
- **HiPC** (High Performance Computing) 2020.
- **ESA** (European Symposium on Algorithms) 2020.
- **SPAA** (Symposium on Parallelism in Algorithms and Architectures) 2020.
- **IPDPS** (International Parallel and Distributed Processing Symposium) 2020.
- **APoCS** (Algorithmic Principles of Computer Systems) 2020.
- **ALLENEX** (Algorithm Engineering and Experiments) 2020.
- **ESA** (European Symposium on Algorithms) 2019.
- **ICALP** (International Colloquium on Automata, Languages and Programming) 2019.
- **SPAA** (Symposium on Parallelism in Algorithms and Architectures) 2019.
- **IPDPS** (International Parallel and Distributed Processing Symposium) 2019.
- **SPAA** (Symposium on Parallelism in Algorithms and Architectures) 2018.
- **HiPC** (High Performance Computing) 2016.
- **Euro-Par** (International European Conference on Parallel and Distributed Computing) 2016.
- **FUN** (Fun with Algorithms) 2016.