Nat Hurtig

nathurtig.com nhurtig@acm.org 0000-0002-0988-1401 nhurtig

EDUCATION

University of Washington, Seattle
Ph.D. in Computer Science & Engineering — *Seattle, Washington*

Rose-Hulman Institute of Technology — **2020 – 2024**
*B.S. in Computer Science & Mathematics – **4.0*** — *Terre Haute, Indiana*
Minors: Computational Science, Cognitive Science, Data Science

PUBLICATIONS

(unless specified otherwise, authors are listed in contributional order.)

Journal papers

2023 (in revision) (alphabetical order) Joanna Boyland, William Gasarch, Nathan Hurtig, and Robert Rust. Big Ramsey degrees of countable ordinals.Submitted to *Combinatorica*.

Peer-reviewed conference papers

2022 Nathan Hurtig, Joseph Hollingsworth, Sarah Blankenship, Eileen Kraemer, Murali Sitaraman, and Jason Hallstrom. Network visualization and assessment of student learning about conditionals. In *ITiCSE '22: ACM Innovation and Technology in Computer Science Education, July 08–13, 2022, Dublin, Ireland.*

2022 Nathan Hurtig, Maren Sorber, Artemis Pados, and Jason Hallstrom. Temporal stability of RSSI as a pedestrian localization metric. In *ACM Southeast Conference (ACMSE), April 18–20, 2022, Oxford, Alabama, United States.*

2022 Nathan Hurtig, Olga Scrivner, and Joseph Hollingsworth. Visualization of students' solutions as a sequential network. In *2022 IEEE Global Engineering Education Conference (EDUCON), March 28–31, 2022, Tunis, Tunisia.*

Book chapters

2025 (in press) (alphabetical order) Casey Garner, Allen Holder, and Nat Hurtig. Uncertain Data Envelopment Analysis: Theory, Algorithms, and Applications. In *Decision-Making Optimization Models for Business Partnerships*, edited by Gholam R. Amin and Mustapha Ibn Boamah. Published by *Routledge*, Ch. 3.

Presentations

2023 (alphabetical order) Jean-Pierre Appel, Patrick Cesarz, Djeneba Diop, Eugene Fiorini, Nathan Hurtig, and Andrew Woldar. Toggle: a combinatorial game based on Lights Out. At *Joint Moravian and Lafayette REU Workshop, July 13, 2023, Easton, Pennsylvania, United States.*

2023 Nathan Hurtig and Joseph Hollingsworth. Analyzing student code elegance using an automated tool. At *Ohio State University Reusable Software Research Group (OSU RSRG) Workshop, May 18-19, 2023, Columbus, Ohio, United States.*

2023 Robert Rust, Joanna Boyland and Nathan Hurtig. When Ramsey theory fails, use more colors. At *Joint Mathematics Meetings, January 04-07, 2023, Boston, Massachusetts, United States.*

2022 (Won 2nd in undergrad research competition) Nathan Hurtig. Interactive network visualization of learning progressions. At *ACM Technical Symposium on Computer Science Education (SIGCSE), March 02–05, 2022, Providence, Rhode Island, United States.*

OEIS Sequences

2023 A364503 (alphabetical order) Jean-Pierre Appel, Patrick Cesarz, Djeneba Diop, Eugene Fiorini, Nathan Hurtig, and Andrew Woldar. Sprague-Grundy values for Heat-Charge Toggle on paths from A364489 where paths with an even number of vertices are odious, or paths with an odd number of vertices are evil.

2023 A364489 (alphabetical order) Jean-Pierre Appel, Patrick Cesarz, Djeneba Diop, Eugene Fiorini, Nathan Hurtig, and Andrew Woldar. Values of n for which the Sprague-Grundy value of Heat-Charge Toggle on an $(n+2)$-vertex path with initial weights $-1, 1^n, -1$ is evil for odd n or odious for even n.

2023 A364451 (alphabetical order) Michael Carrion, Nathan Hurtig, Maggie X. Lai, Sarah Lohrey, Brittany Ohlinger. $a(n)$ is the number of trees of diameter 4 with n vertices that are N-games in peg duotaire.

2023 A364026 Nathan Hurtig. $T(n,k)$ is the big Ramsey degree of k in ω^n, where ω is the first transfinite ordinal.

2023 A363934 (alphabetical order) Jean-Pierre Appel, Patrick Cesarz, Djeneba Diop, Eugene Fiorini, Nathan Hurtig, and Andrew Woldar. $T(n,k)$ is the Sprague-Grundy value for the Heat Toggle game played on an $n \times k$ grid where each vertex has initial weight 1.

HONORS

NSF Graduate Research Fellowship **2024-2029**
National Science Foundation

Paul G. Allen School First-Year Ph.D. Fellowship **2024-2025**
University of Washington, Seattle

Goldwater Scholar **2022-2024**
- One of 22 computer science students selected nationally — *U.S. Congress*

Outstanding Scholar Award **2024**
- Computer Science & Software Engineering department award for a graduating senior — *Rose-Hulman Institute of Technology*

Outstanding Service Award **2024**
- Computer Science & Software Engineering department award for a graduating senior — *Rose-Hulman Institute of Technology*

Heminway Gold Medal **2024**
- Highest honor for academic performance awarded to graduating seniors — *Rose-Hulman Institute of Technology*

Orchestra Outstanding Senior **2024**
- Annual award to one graduating senior *Rose-Hulman Institute of Technology*

Henry Turner Eddy Award **2023**
- Mathematics department award for excellence in applied math *Rose-Hulman Institute of Technology*

ACM SIGCSE Student Research 2nd Place **2022**
- Presented at poster session and invited conference talk *ACM SIGCSE*

Best Presentation **2021**
- REU final presentations *Florida Atlantic University*

RESEARCH EXPERIENCES

Rose-Hulman Institute of Technology **November 2020 – May 2024**
Undergraduate Researcher – CS Education *Terre Haute, Indiana*
- Collaborated with researchers and educators from five institutions
- Designed and implemented a novel educational data analysis system
- Published and presented papers at ACM ITiCSE and IEEE EDUCON

Rose-Hulman Institute of Technology **August 2023 – May 2024**
Senior Thesis – Queueing Theory *Terre Haute, Indiana*
- Explored the known-size M/G/1 queue with constant preemption costs
- Introduced a novel related problem and solved it completely
- Developed a new policy that outperforms the previously best known policy in simulation

University of Maryland, College Park **Summer 2022**
REU Researcher – Combinatorics *College Park, Maryland*
- Investigated intersection of Ramsey Theory and ordinal numbers
- Solved previously open problems
- Authored manuscript for submission to *Combinatorica*

Florida Atlantic University **Summer 2021**
REU Researcher – Internet of Things *Boca Raton, Florida*
- Developed and constructed network-activated robotic platform
- Collected over 30 million data points through robotic automation
- Analyzed feasibility of pedestrian localization with machine learning
- Published and presented paper at ACM Southeast conference

Moravian University **Summer 2023**
REU Researcher – Combinatorial Game Theory *Bethlehem, Pennsylvania*
- Studied combinatorial games played on graphs
- Developed new proof technique using recurrence relations
- Published several OEIS sequences and proved a game's complexity class

TUTORING EXPERIENCES

Rose-Hulman Institute of Technology **August 2022 – May 2024**
Sophomore Resident Tutor *Terre Haute, Indiana*

- Supported Rose-Hulman students through tutoring and mentoring
- Organized and executed social and professional school-wide events
- Facilitated meetings with faculty, staff, and students

Rose-Hulman Institute of Technology **August 2023**
Rose Prime Mentor *Terre Haute, Indiana*

- Organized 2-week precalculus camp to prepare incoming freshmen
- Planned daily review sessions, events, and activities
- Developed skills in tutoring, leadership, and management

Rose-Hulman Institute of Technology **2021 – 2022, 2023 – 2024 (4 quarters)**
Computer Science TA *Terre Haute, Indiana*

- Tutored and graded for our PL, theory, and advanced networks courses
- Transitioned assignments and instructions for PL course to use Racket
- Developed autograding system integrated with Gradescope still in use today

EXTRACURRICULAR

Orchestra & Concert Band **August 2020 – May 2024**
Terre Haute, Indiana

- Managed attendance and music of clarinet section
- Played oboe, bassoon, flute, clarinets, and saxophones

Noblitt Scholars Program **August 2020 – May 2024**
Terre Haute, Indiana

- Contributed to community service projects
- Served on program steering committee

AskRose Homework Help **September 2020 – April 2021**
Terre Haute, Indiana

- Served as over-the-phone STEM tutor for students in grades 6-12