Nicholas Haisler

Curriculum Vitae

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Education

Aug 2022 – Dec 2025 (Expected)

B.S. in Mathematics, Computer Science, and Artificial Intelligence, *Drake University*, Des Moines, IA, USA
GPA: 3.95/4.00
Expected to graduate December 2025.

Research Experience

May 2025 - Aug 2025

NSF REU: Reinforcement Learning for Satellite-Based GPS-Denied UAV Navigation, *Washington University in St. Louis*, St. Louis, MO, USA
Advisor: Prof. Nathan Jacobs

Jan 2024 – Present

Research Assistant, *Department of Computer Science, Drake University*, Des Moines, IA, USA
Advisor: Prof. Andrei Migunov

- Developing an analog compiler that transforms GPACs (General-Purpose Analog Computers) into PPs (Population Protocols).

Funded by U.S. DOE award DE-SC0024278

Jan 2023 – Present

Undergraduate Researcher, *Department of Computer Science, Drake University*, Des Moines, IA, USA
Advisor: Prof. Alimoor Reza

- **Monocular Depth Estimation (Jan 2023)**: Conducted research using the CARLA simulator to collect data for monocular depth estimation.
- **AlphaGo Reconstruction (Jan 2024)**: Implemented Monte Carlo Tree Search and integrated an encoder-decoder model for enhanced sampling, replicating key components of the AlphaGo architecture.
- **Emotional Expression Analysis (Aug 2024 – Present)**: Investigating micro-video emotional expression using semantic segmentation and other image processing techniques.
- **Synthetic Data Generation (Aug 2024 – Present)**: Using domain randomization to produce synthetic datasets, aiming to improve model accuracy when real-world data is limited.

Unpaid research experience encompassing various machine learning projects

Capstone Projects

Aug 2025

SLAM and Digital Twin Construction for Mobile Robotics, *Drake University*, Des Moines, IA, USA
Implemented SLAM (PySLAM) on a mobile base with ROS 2 and depth sensing to generate 3D maps, and built simple digital twins (e.g., NeRF/Gaussian Splatting) to evaluate navigation in real vs. simulated environments.

May 2025 **Reasoning Ability of LLMs in Environments Involving Teamwork**, *Drake University*, Des Moines, IA, USA
Tested LLMs' ability to cooperate with each other in a 2D roguelike, focused on surviving as long as possible.

Aug 2024 **Preserved Properties in Sampled Chaotic Systems**, *Drake University*, Des Moines, IA, USA
Used chaotic systems and the SINDy framework to generate binary sequences that preserve properties such as randomness.

Awards and Honors

April 2025 **AI Student of the Year, Drake University:** Awarded for outstanding academic performance and contributions to the department

April 2025 **CCSC Poster Contest 1st Place** "Bridging the Gap Between Real-World and Synthetic Domains in Semantic Segmentation"

April 2025 **CCSC Poster Contest 2nd Place** "Optimizing Analog Computation: A Smart Dual-Railing Approach for Efficient Compilation"

April 2024 **CCSC Poster Contest 2nd Place** "Compiling to a Nanotech Language: Population Protocols"

Dec 2024 **ICPC Regionals Midwest 16th Place**

Dec 2023 **ICPC Regionals Midwest 20th Place**

Feb 2023 **ICPC Regionals Midwest 37th Place**

Publications

2025 **Haisler, N.**, Huang, X., Migunov, A., Mohammed, K., & Provence, G. *A Selective Dual-Railing Technique for General-Purpose Analog Computers.* Unconventional Computation and Natural Computation, Nice, France, September 2025. *to appear.*

Talks & Presentations

Sept 4, 2025 (scheduled) **A Selective Dual-Railing Technique for General-Purpose Analog Computers**, *UCNC 2025*, Nice, France
Conference presentation.

Conferences Attended

2023, 2024, 2025 Consortium for Computing Sciences in Colleges

2024 CBMS Conference on Algorithmic Fractal Dimensions

2023, 2024 Iowa Colloquium on Information, Complexity, and Logic

References

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Andrei Migunov andrei.migunov@drake.edu

Christopher Porter christopher.porter@drake.edu