Nikola V. Maruszewski

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Education

Georgia Institute of Technology — Atlanta, GA
PhD, Computer Science — *Aug 2025 – Present*
- **Advisor:** Josiah Hester

Northwestern University — Evanston, IL
Master of Science, Computer Engineering — *April 2024 – Jun 2025*
- **GPA:** 4.00/4.00
- **Thesis:** Improved Prefetching Techniques for Linked Data Structures
- **Committee:** *Nikos Hardavellas* (advisor), Peter Dinda, Russ Joseph

Northwestern University — Evanston, IL
Bachelor of Science, Computer Science — *Sep 2022 – Jun 2025*
- **GPA:** 4.00/4.00, *summa cum laude*
- Dean's list with High Honors, all quarters

Experience

Graduate Research Assistant — Aug 2025 – Present
Georgia Institute of Technology — *Atlanta, GA*
Working as a graduate research assistant in the Ka Moamoa Lab.
- Working on timekeeping for low-power embedded and edge devices.

Machine Learning Developer — Sep 2024 – Present
Caterpillar, Inc. — *Remote (consulting)*
Worked part-time in the Autonomy and Automation Division on Machine Learning pipelines.
- Helped bring the project to an MVP and create an initial deployment.
- Worked with architect on major design decisions.
- Responsible for the design and implementation of key features.
- Continuation of work from internship.

Undergraduate Researcher — Sep 2022 – Jun 2025
PARAG@N Lab — *Evanston, IL*
Led a research project to design improved Quantum Systems software.
- Designed and programmed a quantum compiler to optimize quantum circuits for emerging quantum computer topologies.
- Created a development framework and tools for further quantum systems research.
- Student leader of the project while an undergraduate student.

Software Engineering Intern — Jun 2024 – Aug 2024
Caterpillar, Inc. — *Peoria, IL*
Worked in the Autonomy and Automation Division on computer vision and data processing.
- Worked on the design and implementation of a new data warehouse and processing pipeline in Python.
- Designed and implemented distributed concurrency control systems for distributed compute with ZooKeeper.
- Worked a smartphone vehicle calibration system using OpenCV in Python.
- Learned about commercial robotics and autonomy platforms.

Teaching Assistant — Jun 2023 – Jun 2024
Northwestern University — *Evanston, IL*
Acted as an undergraduate peer mentor for CS 321: Programming Languages and CS 213: Intro to Computer Systems.
- Held several office hours each week.
- Answered questions, both synchronously in office hours and asynchronously on a Piazza message board.

Campus Ambassador — Sep 2023 – Jun 2024
Ansys, Inc. — *Evanston, IL*
Acted as the Campus Ambassador for Ansys at Northwestern.
- Researched, reached out to, and scheduled meetings with relevant campus groups to discuss Ansys' tools.
- Organized lunch info sessions for Ansys, including booking rooms and organizing food.
- Coordinated with a member of the Ansys team for the campus work.

Awards and Honors

Outstanding CS Senior | *Northwestern University* May 2025
Given to the top members of the graduating Computer Science class at Northwestern.

McCormick Summer Research Award | *Northwestern University* May 2023
Title: "A Compiler for Quantum Chiplets." Advised by Nikos Hardavellas.

Northwestern Academic Year Undergraduate Research Award | *Northwestern University* Feb 2023
Title: "A Compiler for Quantum Chiplets." Advised by Nikos Hardavellas.

Dean's List with High Honors | *Northwestern University* Dec 2022 — Jun 2025
Awarded each quarter to students with a 4.00 GPA. Received every quarter at Northwestern.

Publications

Improved Prefetching Techniques for Linked Data Structures *M.S. Thesis, Jun 2025*

Nikola Vuk Maruszewski. M.S. Thesis, Northwestern University, Technical Report NU-CS-2025-05, Evanston, IL, June 2025. DOI: https://doi.org/10.21985/n2-bsav-a158. Also, arXiv Hardware Architecture (cs.AR) arXiv:2505.21669, June 2025.

Modular Compilation for Quantum Chiplet Architectures *Preprint, Jan 2025*

Mingyoung Jessica Jeng*, Nikola Vuk Maruszewski*, Connor Selna, Michael Gavrincea, Kaitlin N. Smith, and Nikos Hardavellas. arXiv Quantum Physics (quant-ph) arXiv:2501.08478, January 2025.

(denotes equal contribution)*

Media Coverage:

- The Quantum Insider. Researchers Say Quantum Compiler Boosts Speed And Reliability For Chiplet-Based Modular Systems. January 22, 2025
- Semiconductor Engineering. Parallelized Compilation Pipeline Optimized for Chiplet-Based Quantum Computers. January 21, 2025

Research Grants

McCormick Summer Research Award | *Northwestern University* May 2023
Title: "A Compiler for Quantum Chiplets." Advised by Nikos Hardavellas. $4500 (supplemented to $8000).

Northwestern Academic Year Undergraduate Research Award | *Northwestern University* Feb 2023
Title: "A Compiler for Quantum Chiplets." Advised by Nikos Hardavellas. $1000.

Talks and Presentations

A Compilation Framework for Chiplet-Based Quantum Computing Systems Sep 2023
Given at Northwestern University.

Quantum Computing Research at PARAG@N May 2023
Lecture given for a class session of COMP_ENG 456 at Northwestern University.