Nicholas W. Breitling

breitnw@u.northwestern.edu | +1 (952) 905-4220
744 Applewood Cir., Victoria, MN 55386
linkedin.com/in/nick-breitling/

EDUCATION

Northwestern University, *Evanston, IL* › GPA: 4.0/4.0 — Sept. 2024 – Present
- Relevant coursework: Programming Languages, Data Structures and Algorithms, Computer Systems

Northeastern University, *Boston, MA* › GPA: 4.0/4.0 — Sept. 2023 – Apr. 2024
- Relevant coursework: Accel. Fundamentals of Computer Science 1 and 2, Accel. Discrete Structures, Intensive Math Reasoning, Logic & Computation

Minnetonka High School, *Minnetonka, MN* › GPA: 4.615 (W), 4.0 (UW); ACT: 36 — Sept. 2019 – June 2023
- Relevant coursework: AP CS A, AP CS Principles, Calculus 1-4, Linear Algebra
- National Merit Scholarship Award, Dartmouth Alumni Club Book Award, AP Scholar with Distinction, Summa Cum Laude, Academic Letter (9, 10, 11, 12)

EMPLOYMENT & INTERNSHIP

Humanity Alliance, *Victoria, MN* › Project Lead — May 2021 – May 2023
- Service internship with the Humanity Alliance, non-profit delivering 9,000 meals/wk to food-insecure families
- Developed and programmed a full-stack, user-friendly dashboard to streamline integration of meal requests and delivery data with an interactive map, greatly reducing manual entry time by automating route calculation and assignment
- Maintained communication with organization leadership to address needs for administration, user permissions and security

CodeNinjas Chanhassen, *Chanhassen, MN* › Camp Counselor ("Sensei") — Summer 2021, 2022, 2023
- Lead counselor for weekly camps throughout summer. Provided one-on-one and presentational instruction to guide campers through curriculum and difficult concepts related to programming and application development
- Planned and implemented supplemental lessons in Lua and Scratch programming, 3D modeling, music distribution, and more, fostering an engaging environment for advanced campers

ACADEMIC RESEARCH & PROJECTS

Programming Research Laboratory, *Prague, CZ* › Research Assistant — Jan. 2024 – Sep. 2024
- Collaborated on the development of a new infrastructure for just-in-time compilation of the R programming language
- Aided in transition from C++ to a Java compile server, focusing specifically on RDS serialization
- After completion of RDS writer, integrated serialization system as a communication protocol between C++ frontend and Java backend, enabling comprehensive integration testing via package compilation

Minnetonka Research, *Minnetonka, MN* › Independent Researcher — Sept. 2022 - May 2023
- Project: *Improving sphere blending performance for fluid simulation applications using ray-marched rendering*
- Worked with Vulkan to develop and optimize separate ray-marched and mesh rendering engines, utilizing a smooth-min distance field and a marching-cubes algorithm, respectively, for sphere blending and benchmarking relative performance
- Twin Cities Regional Science Fair: awarded blue ribbon (first place in Systems Software category), purple ribbon (advancement to State Science and Engineering Fair), and Stockholm Junior Water Prize

Other projects *(full list at github.com/breitnw)*
- *mndco11age.xyz:* Portfolio website and webserver; developed and deployed from scratch with OpenSSL and Rust
- *micromusic:* Apple Music miniplayer and queue manager, developed with Rust, C, AppleScript, and SDL2
- *rhyolite:* Vulkan-based mesh rendering engine, developed with Rust and GLSL

EXTRACURRICULAR INVOLVEMENT

Evanston-Skokie School District 65 › Volunteer CS Educator — Jan. 2025 – Present
- Teach weekly computer science classes to 5th graders at Oakton Elementary School as part of education research conducted by Northwestern's TIDAL and tiilt labs
- Introduce students to concepts such as loops, variables, and debugging while fostering self-expression through use of TunePad, a Python-based music production tool

StemOUT, *Boston, MA* › Curriculum Developer — Jan. 2024 – Apr. 2024
- Developed an educational curriculum for elementary (K-5) schoolers with the goal of "teaching AI without computers," including interactive lessons on history, functions, and ethics. Taught this curriculum and others at public libraries.

FIRST Robotics Team 3082 › Captain — Sept. 2019 - May 2023
- Oversaw electronics and programming subteams; led the development of an OpenCV-based stereoscopic vision system, physically-modeled robot simulation, Swerve drivetrain, inverse-multiplexed button board, and other subsystems
- Won Innovation in Control award, progressed to FRC World Championship during 2023 season

Other involvement: Scouts BSA, Eagle Rank; Tonka Hacks Hackathon, 1st place; National Honor Society; Symphonic Band