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| 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 Sept. 2024 – Present

***Northeastern University,*** *Boston, MA*› GPA: 4.0/4.0 Sept. 2023 – Apr. 2024

* Relevant coursework: Accel. Fundamentals of Computer Science 1, Accel. Discrete Structures, Intensive Math Reasoning

***Minnetonka High School,*** *Minnetonka, MN* › GPA: 4.615 (W), 4.0 (UW); ACT: 36Sept. 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 LeadMay 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 AssistantJan. 2024 – Sep. 2024

* Collaborated on the development of a new infrastructure for cached 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 ResearcherSept. 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**

***StemOUT,*** *Boston, MA* › Curriculum DeveloperJan. 2024 – Present

* 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 for free at public libraries.

***FIRST Robotics Team 3082***› CaptainSept. 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

***VANTAGE UX Design***› Project Lead Sept. 2021 - June 2022

* Spearheaded full website redesign for LMI Lawn Care, a local business based in Brainerd, MN. Improved user experience via iterative usability testing; guided team through ideation, data collection, prototyping, development, and presentation

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