

Ben Mechels

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EDUCATION

University of Minnesota

B.S. Computer Science (Honors)

Minneapolis, MN

Sept 2025 - May 2027

- GPA: 4.00/4.00
- Coursework: Computer Architecture, Algorithms & Data Structs, Parallel Computing, Operating Systems
- Extracurricular: Tau Beta Pi, Drones Club, Science & Engineering Student Board, NASA Lunabotics

EXPERIENCE

University of Chicago

Research Intern

Chicago, IL

June 2026 - Aug 2026

- High-performance computing research advised by Professor Kyle Chard
- Funded by the National Science Foundation and UChicago Data Science Institute

University of Minnesota

Undergraduate Researcher

Minneapolis, MN

May 2025 - present

- Systems architecture research advised by Professor Caiwen Ding
- Specialty in data compression, kernel design, and system profiling

University of Minnesota

Teaching Assistant

Minneapolis, MN

Aug 2024 - present

- Position held starting in high school, making me among the youngest appointed
- Taught discussions and labs, wrote problem sets and exams, and held office hours for several courses

PUBLICATIONS

Transit-Layer Tensor Representation for Serverless Inference

B. Mechels, S. Shi, W. Wang, K. Chard

Under conference review - poster submission

FPTC: A Fast Parallel Transform-based Codec for Efficient Asymmetric Signal Compression

B. Mechels, R. Billmeyer, A. Chen, S. Li, C. Ding

Under conference review - arXiv:2605.01086

TALKS

Argonne National Laboratory Seminar

On methods in ultra-fast data compression

August 2026

UChicago Data Science Institute Symposium

On serverless inference framework optimizations

August 2026

PROJECTS

Self-built Compute Cluster

- Designed and built a 36-node compute cluster from recycled PCs using Ansible in high school
- Reached top 30 in the world for first primality tests for prime number research in the Mersenne Project
- Contributed to bio-informatics research through Rosetta@Home's protein folding simulation project

Elliptic Curve Cryptography Implementation

- Developed Weierstrass form Elliptic Curves in Python to examine the relationship between curve parameters and security via cofactor and cardinality
- Provided insights into the security of the ED25519 SSH signature algorithm over small curves

Novel Toroidal Propeller Design

- Designed and manufactured custom toroidal propellers for noise reduction in FPV quadcopters
- Determined the best propeller geometry by wind tunnel testing of designs across the curve spectrum

Vulnerability Report

- Wrote and published a detailed technical report on public school IT vulnerabilities with issues including student portal security, district issued device deprovisioning, and email server misconfiguration
- Referenced by IT experts on local news to call attention to the security concerns discovered

TEACHING

Teaching Assistant - University of Minnesota

- CSCI 4203 / EE 4363: Computer Architecture *Fall 2025*
- CSCI 4061: Introduction to Operating Systems *Fall 2026*
- CSCI 2021: Machine Architecture and Organization *Spring 2025*
- CSCI 2011H: Honors Discrete Structures of Computer Science *Spring 2026*
- CSCI 1135: Computer Science Exercises in Python *Fall 2024*

TECHNICAL

Languages: C/C++, Python, Java, OCaml, Assembly Languages (x86, MIPS), Verilog HDL, Bash

Tools: Linux/UNIX, CUDA, Matplotlib, LaTeX, Vivado, Ansible, Nginx, Tmux, OpenSSH, Git/GitHub

AWARDS

Undergraduate Scholarship *May 2026*

Tau Beta Pi Engineering Honor Society

Science & Engineering Dean's List *Dec 2025*

University of Minnesota CSE

Honors Student *Sept 2025*

University of Minnesota Honors Program

Member *Sept 2025*

Tau Beta Pi Engineering Honor Society

University Presidential Scholarship *Sept 2025*

University of Minnesota

Mangney Endowed Scholarship *Sept 2025*

University of Minnesota CSE

John W. Mooty Scholarship *Sept 2025*

Minneapolis Rotary Club

Virginia Mae Nelson Scholarship *Sept 2025*

Washburn High School

Undergraduate Scholarship *Sept 2025*

Oliveira Foundation

AP Scholar with Distinction *July 2025*

College Board

IB Diploma Recipient *July 2025*

International Baccalaureate Organization

Valedictorian *May 2025*

Washburn High School