CURRICULUM VITAE

DREW M. GJERSTAD

DoD Secret Clearance

Minneapolis, MN

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EDUCATION

University of Minnesota — **2022–2026**
Bachelor of Science in Data Science, Minor in Mathematics — *Minneapolis, MN*
Honors Thesis: Combinatorial Bayesian Optimization driven by Deep Generative Models
PhD applications in progress; decision expected early Spring 2026.

Anoka-Ramsey Community College — **2020–2022**
Associate of Arts in Liberal Arts and Sciences — *Coon Rapids, MN*

RESEARCH EXPERIENCE

University of Minnesota, Department of Computer Science & Engineering — **November 2024–**
Undergraduate Researcher (Supervisor: Professor Aryan Deshwal) — *Minneapolis, MN*

- *Research Focus:* Sequential decision-making under uncertainty using Bayesian optimization and reinforcement learning to accelerate scientific discovery and engineering design in high-dimensional and mixed-variable (discrete, combinatorial) settings.
- Designing Bayesian optimization loops in BoTorch (Python) for high-dimensional, combinatorial objectives.
- Developing Gaussian Process models in GPyTorch (Python) for modeling black-box objective functions.

Naval Surface Warfare Center, Carderock Division — **May 2024–August 2024**
Naval Research Enterprise Internship Program (NREIP) — *Bethesda, MD*

- Conducted a facility characterization test to validate the capabilities of a variable-pressure water tunnel.
- Performed a systematic review of the water tunnel's standard operating procedures, hardware, and software.
- Developed a real-time and post-processing analysis tool and UI in MATLAB for facility characterization tests, including time series and signal analysis components.
- Prototyped data inference methods in Python and MATLAB for integration with an Oracle APEX database.

PROFESSIONAL EXPERIENCE

Optum — **June 2023–August 2023**
Data Scientist Intern — *Minneapolis, MN*

- Modeled business data in Tableau to identify areas to reduce issue turnaround time and issue volume.
- Built interactive dashboards in Tableau including an overview of business integrations, root cause analysis, and statistical process control charts.
- Automated data governance processes in Python to verify proposed data models follow conventions defined in a comprehensive data model.
- Developed an automated data quality assurance workflow in Python to validate Snowflake data lakes.

TEACHING EXPERIENCE

University of Minnesota, Department of Computer Science & Engineering   September 2025–
Undergraduate Teaching Assistant (CSCI 5541: Natural Language Processing)   *Minneapolis, MN*
- Delivering recitations on tools for prototyping, developing, and managing machine and deep learning code.
- Holding office hours to provide students with accessible support for lecture topic and coursework questions.
- Performing grading and review tasks to provide timely, actionable feedback to students.

PROJECTS

Sample-efficient Materials Design via Bayesian Optimization   September 2025–
Link: (not publicly available yet)
- In this project, we focus on efficiently exploring the design space of materials in order to optimize multiple properties while attaining material stability/validity.
- We are focusing on developing methods to guide a deep generative model (i.e., VAE or diffusion model) with high-dimensional Bayesian optimization.

Bayesian Optimization Repository   July 2025–
Link: github.com/drewgjerstad/bayesian-optimization
- The focus of this project is the curation of notes, tutorials, examples, and from-scratch implementations of Bayesian optimization, its applications, and related topics.
- Topics include decision theory, Gaussian processes, utility functions, and acquisition functions.
- Examples include BoTorch tutorials and an introduction to using GPyTorch and GAUCHE for applying Gaussian processes to irregular-structured input representations (i.e., molecular, graph, etc.).
- The repository is updated semi-regularly, dependent on topics relevant to other research projects.

Optimizing Circuit Gate Sizes via Bayesian Optimization   November 2024–
- The focus of this project is using Bayesian optimization to optimize chip design (gate sizing) choices in a high-dimensional, discrete, and combinatorial search space.
- Surrogate models (Gaussian processes) using categorical kernels, graph kernels, and string kernels were developed and evaluated. Moving forward, deep generative models will be examined for such use.
- Several optimization approaches have been explored including trust region and latent space approaches.

AWARDS & HONORS

- Dean's List, College of Science and Engineering, University of Minnesota (2023–2025)
- Dean's List, College of Liberal Arts, University of Minnesota (2023–2025)
- Iron Range Scholarship, University of Minnesota (2022–2026)

PROFESSIONAL MEMBERSHIPS

Association for Computing Machinery (ACM)   September 2025–
Student Member (University of Minnesota)

Institute for Electrical and Electronics Engineers (IEEE)   September 2025–
Student Member (University of Minnesota)

LANGUAGES & TOOLS

Languages: Python, MATLAB, R, Julia, C++, SQL, LaTeX

Libraries: Matplotlib, Pandas, Scikit-Learn, TensorFlow, PyTorch, GPyTorch, BoTorch, JuMP

Tools: Git, GitHub, Weights & Biases, Docker, Tableau, Snowflake, PostgreSQL, Microsoft Excel