

CURRICULUM VITAE

# DREW M. GJERSTAD

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## EDUCATION

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<b>University of Minnesota</b> <i>Bachelor of Science in Data Science, Minor in Mathematics</i> <i>Honors Thesis: Combinatorial Bayesian Optimization driven by Deep Generative Models</i> <i>PhD applications in progress; decision expected early Spring 2026.</i>	<b>2022–2026</b> <i>Minneapolis, MN</i>
<b>Anoka-Ramsey Community College</b> <i>Associate of Arts in Liberal Arts and Sciences</i>	<b>2020–2022</b> <i>Coon Rapids, MN</i>

## RESEARCH EXPERIENCE

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<b>University of Minnesota, Department of Computer Science &amp; Engineering</b> <i>Undergraduate Researcher (Supervisor: Professor Aryan Deshwal)</i>	<b>November 2024–</b> <i>Minneapolis, MN</i>
<ul style="list-style-type: none"><li>• <i>Research Focus:</i> 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.</li><li>• <i>Current Project:</i> Sample-efficient materials design via Bayesian optimization to adaptively guide deep generative models to accelerate materials discovery. The initial approach used local latent space Bayesian optimization (LOL-BO) to guide a VAE model, and the current approach is focused on fine-tuning diffusion models pre-trained on materials datasets.</li><li>• Designing Bayesian optimization loops in BoTorch (Python) for high-dimensional, combinatorial objectives.</li><li>• Developing Gaussian Process models in GPyTorch (Python) for modeling black-box objective functions.</li></ul>	
<b>Naval Surface Warfare Center, Carderock Division</b> <i>Naval Research Enterprise Internship Program (NREIP)</i>	<b>May 2024–August 2024</b> <i>Bethesda, MD</i>
<ul style="list-style-type: none"><li>• Conducted a facility characterization test to validate the capabilities of a variable-pressure water tunnel.</li><li>• Performed a systematic review of the water tunnel's standard operating procedures, hardware, and software.</li><li>• Developed a real-time and post-processing analysis tool and UI in MATLAB for facility characterization tests, including time series and signal analysis components.</li><li>• Prototyped data inference methods in Python and MATLAB for integration with an Oracle APEX database.</li></ul>	

## PROFESSIONAL EXPERIENCE

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<b>Optum</b> <i>Data Scientist Intern</i>	<b>June 2023–August 2023</b> <i>Minneapolis, MN</i>
<ul style="list-style-type: none"><li>• Modeled business data in Tableau to identify areas to reduce issue turnaround time and issue volume.</li><li>• Built interactive dashboards in Tableau including an overview of business integrations, root cause analysis, and statistical process control charts.</li><li>• Automated data governance processes in Python to verify proposed data models follow conventions defined in a comprehensive data model.</li><li>• Developed an automated data quality assurance workflow in Python to validate Snowflake data lakes.</li></ul>	

## TEACHING EXPERIENCE

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**University of Minnesota, Department of Computer Science & Engineering**  
*Undergraduate Teaching Assistant (CSCI 5541: Natural Language Processing)*

**September 2025–**  
*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 reviewal tasks to provide timely, actionable feedback to students.

## PROJECTS

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**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](https://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

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- 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

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**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

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**Languages:** Python, MATLAB, R, Julia, C++, SQL, L<sup>A</sup>T<sub>E</sub>X

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

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