

BATSAMBUU BATBOLD

St. Paul, MN | (763) 321-7263 | batsambuub2425@gmail.com | [GitHub](#) | [Portfolio](#)

EDUCATION

Macalester College | St. Paul, MN | Expected May 2027

B.A. Mathematics & Computer Science | GPA: 3.96/4.0

Relevant Coursework: Probability, Network Science, Statistical Machine Learning, Computational Linear Algebra, Database Management Systems

United World College Maastricht | Netherlands | May 2023

IB Diploma (43/45), Bilingual Diploma

HONORS & AWARDS

- **International Mathematical Olympiad (IMO, the World Championship Mathematics Competition for High School students):** Bronze Medalist (2021), Honorable Mention (2020) — top 250 globally among high school mathematicians.
- **1st Place, Macalester ASA DataFest** (2025): Performed exploratory data analysis on large-scale geospatial datasets in R, identified spatial patterns, and presented actionable location recommendations to a panel of judges.
- **1st Place, Konhauser Problemfest** (2026): Won a multi-college math competition (Macalester, Carleton, St. Olaf, St. Thomas, Augsburg) — Macalester's first victory since 2018.

EXPERIENCE

Mathematics Domain Expert (Frontier AI) | Mercor (Remote) | Dec. 2025 – Jan. 2026

- Authored original competition-level math problems to evaluate state-of-the-art AI models. Assessed model-generated proofs for logical correctness, identified reasoning errors, and provided annotated step-by-step solutions for AI training data.

Full Stack Developer & Organizer | Young Mathematicians of Khuvsgul NGO | May 2019 – Present

- Created a Mongolian-language [olympiad training platform](#) with structured problem archives, courses, live competitions, and historical contest data. Wrote SQL queries with indexing to power search and data retrieval. Grew to 100+ users and 1,300+ daily visitors.
- Organize free summer math camps and lessons for 30+ rural students and weekly online contests, improving STEM access in Mongolia.

Undergraduate Preceptor | Macalester College | Jan. 2024 – Present

- Facilitate learning for Computational Linear Algebra, Linear Algebra, and Intro to CS. Communicate mathematical concepts to students of varying skill levels.

Teaching Assistant | Delgermurun Secondary School | Summer 2025

- Coached students for the International Math Contest for Juniors; one student earned a Silver Medal. Designed a Quarto [website for math and programming lessons](#).

RESEARCH & PUBLICATION

Research Assistant & Data Analyst | Macalester College | Summer 2026

- Analyzed a network of scientific concepts from 70 million academic papers across 150+ fields using Topological Data Analysis (TDA) to identify knowledge gaps and concept clusters.
- Built [TopoLens](#), an interactive persistent homology visualizer enabling researchers to detect structural holes in knowledge networks and generate publication-ready data visualizations.
- Developed custom graph-layout algorithms for 10,000+ node networks, reducing cycle-edge crossings by ~15%.

From Chaos to Continents | Python, NumPy, Streamlit, Blender

- Engineered a procedural terrain generation engine using Voronoi Diagrams and Perlin Noise to create 50,000+ polygon worlds.
- Accepted and presented at The International Symposium on Computational Geometry (SoCG 2026) as a multimedia submission.

PROJECTS

Art2Vec: Quantitative Analysis of Art Movements | Python, Pandas, Scikit-learn, SciPy, NetworkX | May 2026

- Modeled 16,000+ paintings as co-occurrence networks using Louvain community detection and centrality metrics.
- Built a content-based recommendation system using feature vectors, cosine similarity, and k-nearest neighbors.

NBA 2K Player Rating Simulator | Python, Pandas, Scikit-learn, Streamlit | Dec. 2025

- Trained XGBoost and Random Forest regression models to predict NBA 2K ratings from real-world stats, achieving an average MAE of 8.58 across 36 attributes (best: Free Throw at 2.93; worst: Intangibles at 14.00). 5-fold cross-validated.
- Feature importance analysis revealed per-minute efficiency metrics outperform raw totals as predictors. Built an ETL pipeline and an interactive Streamlit dashboard for exploring predictions.

TECHNICAL SKILLS

Languages: Python, R, SQL, Java, C++, TypeScript, JavaScript, HTML/CSS

Libraries & Frameworks: Pandas, NumPy, Scikit-learn, SciPy, NetworkX, Matplotlib, Seaborn, Streamlit, React, Next.js

Tools: Git, Excel, LaTeX, Quarto, PostgreSQL, Supabase, Jupyter Notebooks

Technical Areas: Statistical Modeling, Regression Analysis, Exploratory Data Analysis, Data Visualization, Machine Learning, Network Analysis, Topological Data Analysis, SQL Query Optimization, Data Cleaning & ETL, Quantitative Research