

Batsambuu Batbold

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EDUCATION

Macalester College | St. Paul, MN | Expected May 2027 | **B.A. Mathematics & Computer Science** | GPA: **3.97/4.0**

Relevant Coursework: Statistical Machine Learning, Computational Linear Algebra, Software Design, Algorithms

United World College Maastricht | Netherlands | May 2023

International Baccalaureate Diploma (**43/45**), Bilingual Diploma.

HONORS & AWARDS

- **International Mathematical Olympiad (IMO)**: Bronze Medalist (2021), Honorable Mention (2020)
- **1st Place, Macalester ASA DataFest**: Analyzed geospatial data using **R** to visualize patterns and recommend optimal locations for a client case study. (March 2025)
- **1st Place, Macalester Local Programming Contest**: Solved algorithmic competitive programming problems using **C++**. (April 2025)

EXPERIENCE

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

- Authored original, IMO-level problems in Algebra, Number Theory, and Combinatorics designed to stump SOTA AI models.
- Graded model-generated proofs to identify specific logic errors and provided correct, step-by-step reasoning for training data.

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

- Architected and built a comprehensive [Learning Management System platform](#) using **Next.js 16**, **TypeScript**, and **PostgreSQL (Supabase)** to host math courses and manage contest data for 300+ annual participants.
- Designed a relational database schema to model dependencies between courses, users, and problem attempts, and implemented Role-Based Access Control (RBAC) for admin security.
- Integrated React-Markdown and KaTeX to build a WYSIWYG editor that renders LaTeX mathematical notation instantly, replacing error-prone manual table entry for admins.
- Organize free summer mathematics programs and write lessons for 30+ rural students in Mongolia, improving access to STEM education.

Undergraduate Preceptor | Macalester College | Jan. 2024 - Present

- Facilitate learning for undergraduate courses, including **Computational Linear Algebra**, **Linear Algebra**, and **Intro to Computer Science**.

Teaching Assistant | Delgermurun Secondary School | Summer 2025

- Prepared students for the International Math Contest for Juniors; coached one student to a Silver Medal.
- Designed and maintained a [Quarto website](#) to host math, programming, and English lessons.

OTHER PROJECTS

Mosaic Photography Platform | Next.js, TypeScript, PostgreSQL | Ongoing

- Developing a scalable portfolio builder for photographers; currently live as a personal MVP gallery.
- Implemented serverless image processing with Cloudflare R2 storage, color palette extraction, and EXIF metadata parsing.

Procedural Map Generator (Capstone) | Python, NumPy, Streamlit | Fall 2025

- Engineered a procedural terrain generation engine using Voronoi Diagrams and Perlin Noise to create 50,000+ polygon worlds.
- Implemented **NumPy vectorization** to replace iterative loops, reducing map generation time by 40%.

SKILLS

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

Frameworks & Tools: React, Next.js, Node.js, Git, LaTeX, Supabase, Quarto.

Technical Areas: Data Structures & Algorithms, Object-Oriented Programming, Statistical Analysis and Visualization.