Shengming Zhou

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EDUCATION

University of Minnesota (UMN) **2025 – Present**
Bachelor of Arts in Computer Science & Math MN, USA

- **GPA: 4.0/4.0**
- Relevant Courses: Matrix Theory, Database System, Graphics

Shandong University **2023 – 2025**
Bachelor of Science in Mathematics and Applied Mathematics Shandong, China

- **GPA: 82.1/100**
- Relevant Courses: Real/Complex Analysis, Probability Theory, ODE

PROJECTS

Ray Tracing Renderer **2026**
Coursework

- Implemented a ray tracing renderer in C++ supporting spheres and triangle meshes
- Developed ray–object intersection algorithms and barycentric interpolation for smooth shading and texture mapping
- Applied the Phong illumination model with shadow computation and texture-based material properties
- Extended the renderer with recursive ray tracing to simulate mirror reflection and refraction
- Incorporated Fresnel reflectance (Schlick approximation) and index-of-refraction tracking for realistic light transport

Thermodynamic Formalism for Subshifts of Finite Type **2025**
Research Report

- Studied Subshifts of Finite Type (SFTs) via thermodynamic formalism, connecting symbolic dynamics with entropy, invariant measures, and fractal geometry
- Derived topological entropy using Perron–Frobenius theory and constructed the Parry measure as the unique measure of maximal entropy
- Verified ergodic convergence numerically using the Birkhoff Ergodic Theorem
- Realized symbolic systems as Iterated Function Systems (IFS) and computed Hausdorff dimensions via Bowen's formula
- Applied the framework to RLL(1,3) constrained codes, computing exact channel capacity and pattern frequencies beyond heuristic methods

EXPERIENCE

Research Assistant **2026**
Long-horizon Agent Memory & Personalization Benchmark

- Designed and implemented a QA-based evaluation system for long-horizon LLM memory and personalization tasks
- Developed automated atomic question generation pipelines to probe model consistency and recall over extended contexts
- Built end-to-end evaluation workflows in Python, including data processing, inference orchestration, and result aggregation
- Deployed and maintained experimental pipelines on Linux servers, handling environment setup, debugging, and performance issues

SKILLS

Mathematics: Matrix Theory, Probability Theory, Dynamic System, Stochastic Process
Programming: C/C++, Python, SQL (PostgreSQL), Java.
Frameworks & Tools: Git, Docker, PyTorch, NumPy, LaTeX.