

Dimitri Chrysafis

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Education

University of Wisconsin–Madison
Bachelor of Science in Computer Science

Graduating May 2027
GPA: 4.0

Open Source Contributions

Simplex Chat

12 Approved Pull Requests

- Engineered high-performance multi-device message synchronization system with intelligent network connection manager that dynamically optimizes active server connections, reducing message delivery time by **8×** (from 800ms to under 100ms) while using **20×** less bandwidth through efficient differential sync that eliminates duplicate messages and ensures seamless conversation continuity across phones and tablets

Taichi

8 Approved Pull Requests

- Redesigned Apple Metal backend implementing buffer–image copy routines at GPU command list level
- Enabled direct GPU memory transfers between buffers and textures on macOS, removing CPU-side staging overhead

Projects

Gesture-Controlled Robotic Arm Using Fine-Tuned Vision Models

- Fine-tuned ResNet-50 and EfficientNet on **40,000+ hand and arm gesture videos** collected from multiple camera angles and lighting conditions to recognize 25 distinct gestures (pointing, grasping motions, directional commands), achieving **91% accuracy** in translating human movements into real-time control signals for a 6-DOF mechanical robot arm with **30 FPS inference** and sub-200ms latency on edge hardware

Interactive 3D Fluid Simulator Using Material Point Method [\[Demo\]](#) [\[GitHub\]](#)

- Built browser-based physics engine implementing Material Point Method (MLS-MPM) with WebGPU compute shaders, simulating **400,000+ particles** in real-time with interactive camera controls and dynamic boundary animations
- Optimized particle-to-grid transfers through GPU parallelization and fixed-point arithmetic, achieving smooth performance for dam break scenarios and real-time particle injection

High-Performance Web-Based Fractal Renderer [\[Blog\]](#)

- Engineered real-time fractal visualization system supporting $10^{15} \times$ magnification for Mandelbrot, Newton's, and Kleinian limit sets using GPU-accelerated WebGL fragment shaders with double-precision emulation
- Achieved **60×** performance improvement through adaptive sampling, tile-based rendering, and optimized complex arithmetic reducing computational overhead by 85%

Tennis Match Prediction System

- Built ensemble classifier using CatBoost on **92,000 ATP matches (1982-2024)** scraped from historical archives, engineering features including player ELO ratings, surface-specific performance metrics, head-to-head statistics, recent form indicators, and fatigue scores from tournament schedules to achieve **83.7% prediction accuracy**, outperforming baseline models by **12%**

Skills and Interests

Languages: C++, Python, Swift, Rust, Go, Java, JavaScript/TypeScript, SQL, LaTeX, CUDA, OpenCL, Bash, Git

Tools: PyTorch, TensorFlow, JAX, NumPy, scikit-learn, Metal, Docker, Kubernetes, Hugging Face, OpenCV

Interests: Competitive marathon runner and triathlete; Calisthenics, Squash