Dimitri Chrysafis

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Education

University of Wisconsin–Madison Graduating May 2027

Bachelor of Science in Computer Science **GPA: 4.0**

Software Experience

Simplex Chat

- Engineered high-performance multi-device message synchronization system with intelligent network connection manager that dynamically optimizes active server connections, keeping message delivery under **150ms** while substantially reducing bandwidth usage through efficient differential sync that eliminates duplicate messages and ensures seamless conversation continuity across phones and tablets

Taichi

- 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

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Projects

Gesture-Controlled 3D Hand in Blender

- Built an end-to-end gesture pipeline, collecting and labeling **40,000+ multi-angle hand and arm videos** and fine-tuning ResNet-50 / EfficientNet to recognize 25 gestures with **91% accuracy**
- Integrated the trained models with a rigged 3D hand in Blender via Python scripting, driving finger and wrist articulation in real time at **30 FPS** with sub-200ms latency

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 for Mandelbrot, Newton's, and Kleinian limit sets using GPU-accelerated WebGL fragment shaders optimized for deep zoom
- Achieved up to **60×** speedup through adaptive sampling, tile-based rendering, and optimized complex arithmetic

Tennis Match Prediction System

- Built ensemble classifier using CatBoost on **92,000 ATP matches (1982-2024)** obtained from publicly available historical datasets, 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, Rust, Go, Swift, JavaScript/TypeScript, SQL

ML / Data: PyTorch, TensorFlow, NumPy, scikit-learn, Hugging Face, OpenCV

Systems: CUDA, Metal, Docker, Kubernetes, OpenCL

Tools: Bash, Git, LaTeX

Interests: Competitive marathon runner and triathlete; Calisthenics, Squash