Andrew D. Leach

andrewleach38@gmail.com | linkedin.com/in/andrewleachtx | andrewleachtx.github.io

Education

B.S. in Computer Science (Hons), Minor in Statistics — Expected May 2025

Texas A&M University, College Station, TX — ***GPA: 3.91/4.0***

- Writing *URS* thesis on deep reinforcement learning and GPU optimization for rigid body simulation.
- Pursuing computer graphics and computing research under the *Aggie Graphics Group*.

Experience

Research Assistant — Aug 2024 - Present

Aggie Graphics Group — *College Station, TX*

- Engineered and optimized **CUDA/C++** *rigid body simulator* to introduce new features and benchmarks for research project in *Dr. Shinjiro Sueda*'s lab. Familiarized myself with new technologies and theory, implementing CUDA-based simulations in Linux environment for performance evaluation and integration testing.
- Pushed performance gains to hardware limits, **achieving simultaneous execution of 10,000 unique simulations** on a RTX 4090. Added support for complex shape meshes, convex-hull decomposition, Covariance Matrix Adaptation (CMA) integration, and other deep learning processes.
- **Co-authored SIGGRAPH submission** (in review); delivered scenes, simulations, and CMA pipeline scaling up to **8,000**+ environments per learning step. Provided benchmarks and figures demonstrating cutting-edge parallelism for robotics and reinforcement learning.

Software Engineer Intern — Jun - Aug 2024

J.P. Morgan Chase & Co. — *Plano, TX*

- Designed and deployed full-stack documentation tool to provide relevant team documentation for users, preventing LLM hallucinations and reducing **74%** of ticket volume.
- Initiated cross-team meetings to refine our solution, problem-solve constraints, and gather feedback to validate its efficacy. Led presentations to executives and users, promoting LOB-wide usage and receiving feedback.
- Built high-performance Python backend with NLTK and WordNet, achieving up to **99%** similarity scores for retrieving relevant docs. Optimized query and result storage with MongoDB, a non-relational database.

Lead Teaching Assistant - Data Structures & Algorithms — Aug 2023 - Present

Texas A&M Dept. of Computer Science & Engineering

- Managed course synchronization for **300**+ students across 16 sections; maintained and created autograders for 7 programming assignments with full test coverage and documentation; produced material for twice-weekly recitations; led weekly reviews and *videos* receiving **7500**+ **views** and positive student feedback.
- Led coordination with faculty and TAs, making executive decisions for course logistics and student support. Made scripts and autograders that relieved TAs of manual grading and workload by ∼**60 hours of work** per semester.

Projects

CPU Multithreaded Ray Tracing Engine | *C++, pthreads* — Apr 2024

- Wrote **vanilla C++ ray tracer** with support for sphere, ellipsoid, cube, and triangle intersection tests with multi-threading, reflective Blinn-Phong mixtures, and constructive solid geometry logic for greater complexity.
- Accelerated render time up to **90.97%** with CPU-side multithreading, halving processing latency.

J.P. Morgan & Chase Code For Good Hackathon | *Python, MongoDB, Flask, React + JS* — Oct 2023

- Supported team of six during 24-hour window to develop new full-stack system for CanCare Inc., a non-profit supporting patients throughout their cancer journey.
- Organized meetings and led product presentation. Generated and parsed **thousands of sample patient records** with Python/Faker to be used with matching system using heuristics such as cancer type, age, experience, etc.

Additional Information

Skills: C++, CUDA, Python scripting, WSL/Linux, Git/GitHub, LaTeX, Markdown
Libraries: OpenGL, Eigen, GLM, GLSL, MPI, PyTorch, scikit-learn
Favorite Coursework: Computer Graphics, Operating Systems, Physically-Based Modeling, Computer Animation
Interests: Competitive swimming, bodybuilding, fitness, video game graphics, systems programming, and injury rehab