XIAODONG AN

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EDUCATION

Ph.D. in Physics, Georgia Institute of Technology — Expected Aug 2026
Relevant Coursework: Computational Physics, Nonlinear Dynamics

M.S. in Computational Science and Engineering, Georgia Institute of Technology — Expected Dec 2026
Relevant Coursework: Machine Learning, Algorithms, Computational Data Analysis

B.S. in Physics, The Hong Kong Polytechnic University — May 2022

SKILLS

Technical Skills	WebGL, OpenGL, GLSL, HPC, FastAPI, Docker, Git, PyTorch
Programming Languages	Python, MATLAB, JavaScript, TypeScript, SQL, HTML/CSS

EXPERIENCE

Machine Learning Engineer — Dec 2024 – Aug 2025
Scam AI — *Berkeley, CA*

- Led a team of 5 to design and automate large-scale adversarial data generation pipelines by orchestrating multiple face-swap models with distributed **PyTorch** training and automated dataset curation.
- Deployed production-grade **FastAPI** microservices with **Docker**, optimized GPU inference latency/throughput and mixed-precision acceleration for real-time face-swapping and detection.
- Partnered with cross-functional teams to fine-tune detection models using **hard negative mining**, **contrastive loss**, and **Scikit-learn** evaluation pipelines, boosting production detection accuracy from 80% to 97%.

PROJECTS

Modeling and Quantifying the Complex Cardiac Systems (ArXiv) - *arXiv:2508.14303*. Designed and modified the **3V-SIM model** and **OVVR human model** using **WebGL** to perform autonomous parameters tuning and capture of spatioemporal data. Quantified complexity using **Lyapunov Exponents** metrics, and linked model dynamics to physiological insights. Presented the result on **SIAM AN24** and **APS March 2025**.

Diffusion-Coefficient Power Laws and Defect-Driven Glassy Dynamics in Swap Acceleration (PRL 2022) — *Phys. Rev. Lett. 129, 168002 (2022)*. Studied defect-mediated relaxation mechanisms and scaling laws in glassy systems using particle-swap dynamics.

Agentic ArXiv Paper Searcher (2025) Developed an autonomous research assistant using **OpenAI LLMs**, **LangChain**, and **arXiv API**, integrating multi-agent orchestration, retrieval-augmented generation (RAG), tool calling, and modular workflows for automated literature analysis.

IMC Prosperity World Trade Competition (2024) — Led a team of 5, ranking top 3% globally (out of 10,000+ participants) and top 0.05% in manual trading. Designed algorithmic trading strategies in Python and optimized execution under simulated real-market constraints.

PUBLICATIONS

Gautham Gopinath, Xiaodong An, et al. (2022). **Diffusion-Coefficient Power Laws and Defect-Driven Glassy Dynamics in Swap Acceleration**. *Physical Review Letters*. DOI: 10.1103/PhysRevLett.129.168002

Xiaodong An, et al. (2025). **Quantifying The Complex Spatiotemporal Chaos of Cardiac Fibrillation in Ionic Models Across Parameter Regimes**. *arXiv preprint*, arXiv:2508.14303