

XIAODONG AN

+1(424) 475-1233 ♦ Atlanta, GA

xan37@gatech.edu ♦ [linkedin](#) ♦ www.xiaodongan.cn

OBJECTIVE

PhD with 3+ years of experience in doing quantitative studies on bio-physical models, seeking internship roles.

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 2025
Relevant Coursework: Modeling and Simulation, Algorithms and Computational Data Analysis

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

SKILLS

Technical Skills Git, NumPy, Pandas, PyTorch, Scipy, Tableau, Bayesian ARIMA, Machine Learning
Programming Languages Python, MATLAB, WebGL, SQL, Javascript, HTML&CSS

PROJECTS

Quantification of the complexity for Cardiac systems (Time Series Analysis, WebGL, Python) Developed a chaos quantification method for time series data from the cardiac system. Used only 1% of the data length needed for the regular temporal chaos quantification algorithm with a spatial-temporal algorithm. Presented the result on [SIAM AN24](#) and accepted by **APS March 2025**. ([See it here](#))

Determining Spatial-Temporal Chaos with Reservoir Computing. (Machine Learning, PyTorch, Reservoir Computing) Implemented **reservoir computing** to determine chaos, consuming 90% less data compared to the conventional data-condensed method.

Reconstructing the Heart Voltage Data using Transformer. (PyTorch, Transformer, Time-Series Analysis) Preprocessed the data by discretizing it so that the Large Language Model (**LLM**) such as **transformer** can be applied. Trained the transformer to reconstruct the chaotic attractor of data in phase space.

Predicting the Cardiac Time-series Data using Bayesian ARIMA. (statsmodels, pandas, Tableau) Preprocessed and cleaned the data using **pandas**. Trained an Autoregressive Integrated Moving Average (**ARIMA**) model with Action Potential Duration (APD) data from a heart model. Improved the accuracy by 200% compared to single exponential smoothing.

Forest Fire Simulation Using Partial Differential Equation and Agent-Based Modeling. (PIL, skimage, Git, Python) Preprocessed the images by detecting firing pixels with PIL and skimage. Numerically solved a PDE model to simulate the 2018 California forest fire. ([See it here](#))

SPH-Liquid simulation with GPU acceleration (Javascript, Python, WebGL) Improved the neighbor searching speed by 90% with **Spatial Hashing**. Increased frame generation speed by 50% using **WebGL**. ([See it here](#))

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

AWARDS

- (10000 USD) HKSAR Government Scholarship (2021), Hong Kong
- (2000 USD) HKSAR Government Scholarship - Reaching Out Award (2019), Hong Kong