# Fred (Zeyuan) Xu

http://heraclixus.github.io

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## EDUCATION

- **University of California, Los Angeles**  Los Angeles, CA
  *Ph.D. in Computer Science*  *Sep 2022-*

- **University of California, Los Angeles**  Los Angeles, CA
  *Bachelor of Science in Computer Science and Engineering & Minor in Mathematics*  *Sep. 2013 – Mar. 2018*

## PROFESSIONAL EXPERIENCE

- **Hitachi America**  Santa Clara, CA
  *Research Scientist Intern*  *June 2024 - Sep 2024*
  - **Sensorless Monitoring of Cargo Containers**: Performed **feature engineering**, **regression analysis**, and **time series analysis** on Hitachi customer's cargo container temperature and humidity data across the globe to estimate operational risks associated with container shipments. Improved performance on baseline model by 30%.
  - **Monte Carlo Simulation for Risk**: Run Monte Carlo simulation based on financial indicators and corporate portfolios and conduct **time series analysis** to estimate corporate financial risk in the face of currency rate and other market shifts.

- **Amazon.com, Inc.**  Manhattan, NYC
  *Applied Scientist Intern*  *June 2022 - Sep 2022*
  - **Audience Embedding for Recommendation**: Implemented a **Deep Learning** based bipartite graph embedding model to facilitate representation for **recommendation** and user group behavior predictions. Proposed to use **fuzzy set** based embedding to further improve the task with logical expressions; outperform the baseline model by $\geq 30\%$

- **Norton Lifelock Inc.**  Culver City, CA
  *Software Engineer*  *Nov 2019 - May 2021*
  - **Privacy Monitor for NSV**: Developed privacy monitor feature and client kit in Swift for the Norton Private VPN iOS App. The feature increases customer interest in privacy product by 45%

  - **Norton Secure VPN - Android**: Participated in maintaining and developing the Norton Secure VPN App for Android, including implementing new features that involves split tunneling and torrenting support. The App has 10,000,000+ installs.

- **Symantec Corporation**  Culver City, CA
  *Software Engineer*  *July 2018 - Nov 2019*
  - **NSUWP**: Developed, Integrated, and unit tested the core C#, Angular, and C++/WinRT code of Norton Security Universal Windows Platform App (NSUWP). Participated in creating the product's threat Model and implemented encryption, authentication, and file integrity mechanism for the UWP App.
  - **Secure File Transfer MVP**: Developed the MVP in Android, PWA, and iOS, with the help of Xamarin and Angular, for securely Transferring files using TLS, RSA, AES256, SHA256, with key exchange and management using Azure KeyVault and authentication.
  - **White Glove Service MVP**: Developed the Chrome Extension for White Glove Service, a service for opting out users from data broker websites to preserve their privacy.

## PROJECTS/PUBLICATIONS

- **FUSE: Measure-Theoretic Compact Fuzzy Set Representation for Taxonomy Expansion**: *First Author*, worked on Compact Neural Symbolic Reasoning Using a novel mathematical construct, Simple Fuzzy Set and Simple Fuzzy Set Embedding for taxnonomy expansion, Accepted by The ACL'24
- **Adapting and Fusing LLM with Fuzzy Logic for Knowledge Graph Query Answering**: In Preparation: Use Fuzzy Set Embedding to Enhance **LLM Reasoning** on **Knowledge Graph** Query Answering.
- **Market Simulation using Signature Diffusion**: In preparation: Generate Novel financial time series (based on the limit order book) using signature-based **diffusion models**.
- **Ocean Index Dynamics Modeling using Graph ODE**: In preparation: Use **Graph Neural Ordinary Differential Equations** to model the dynamical interactions between ocean indices and to forecast climate anomaly.

- **Diffusion Causal Model for Medical Image Evolution**: In preparation: propose a **conditional diffusion generative model** with **causal representation learning** to help generate medical images based on treatments.

## Skills

- ○ **Languages**: : C++, C, C#, Python, Shell, SQL, R, Java.
- ○ **Frameworks**: : HuggingFace, OpenAI, Claude, Gemini, PyTorch, PyTorch Geometric, scikit-learn,JAX, TensorFlow, pandas, numpy, scipy, statsmodels, seaborn, matplotlib, Huggingface, pytorch-geometri, Hadoop, Spark, Gradio
- ○ **Technologies**: : LLM Fine-Tuning, LLM Prompting, LLM evaluation, Time series modeling and analysis, statistical and probabilistic machine learning, Natural Language Processing, Neural-symbolic reasoning, physical simulation, AWS Sagemaker, S3, EC2, Lambda.
- ○ **Certifications and MOOCs**: : Security+, Cryptography I (Coursera), GAN specialization (DeepLearning.ai), Causality (Coursera), Deep Reinforcement Learning (Udemy), Actor-Critic Methods (Udemy)

## Teaching Experience

- **University of California, Los Angeles** — Los Angeles, CA
  *Summer Institute Instructor* — *July 2023 - Aug 2023*
  - ○ **UCLA Summer Institute**: Teaches **CS 97: Introduction to Data Science** to advanced high school students for college-level course credits; received **8.75/9 overall rating** as instructor.
  - ○ **Teaching Assistant**: Teaching Assistant for CS 148 (Introduction to Data Science), CS 247 (Advanced Data Mining), CS 33 (Computer Organization), CS M51A (Logical Circuits).

## Community

- **Machine Learning Speaker**: gave machine learning talks and intros at student club and at company knowledge sharing meetings.
- **Presentation Speaker**: gave presentations at UCLA Data mining study group on papers and courses focusing on machine learning and deep learning.
- **Academic Reviewer**: serves as reviewer for conferences such as ICLR, WWW, CIKM, and journals like PLOS.

## Links

- **Github**: https://github.com/heraclixus, https://github.com/xuzeyuanfred
- **LinkedIn**: https://www.linkedin.com/in/fred-xu-heraclitus
- **Blog & Personal site**: http://heraclixus.github.io