Xirong Cao

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Education

Fordham University — New York, NY
M.Sc. in Computer Science; ***GPA: 3.82/4.00*** — *Jan 2022 – Feb 2024*
- **Thesis:** Generative AI related (working on it)

University of California, Irvine — Irvine, CA
B.A. in Psychology; ***GPA: 3.2/4.00*** — *Fall 2015 – Jun 2019*
- **Path:** Cognitive Ability, Memory, Learning, Probability Linguistic

Publications

[1] **Xirong Cao**, Xiang Li, Divyesh Jadav, Yanzhao Wu, Zhehui Chen, Chen Zeng, and Wenqi Wei. "Invisible Watermarking for Audio Generation Diffusion Models", IEEE/TPS Conference on Trust, Privacy and Security in Intelligent Systems, and Applications (TPS), Atlanta, November 2023. [Link]

[2] **Xirong Cao**, Mohamed Rahouti, Senthil Kumar Jagatheesaperumal, Kaiqi Xiong. "Psychological Information Sharing Using Ethereum Blockchain and Smart Contracts", BCCA 2023 Conference Blockchain Computing and Applications, Kuwait Fintech and Blockchain Summit, Kuwait, October 2023.

Research Experience

Invisible Watermarking for Audio Generation Diffusion Models — Fordham, NY
Graduate Researcher — *Jun 2023 – Sep 2023, [code]*
- Propose backdoor audio idea, worked on IP protection for generative AI under the supervision of Dr. Wenqi Wei.
- Write model pipeline for mel-spectrogram conversion, triggers embedding, and different watermarking diffusion.
- Train VGG-16 and ResNeXt classifers. Test different triggers for backdoor performance. Plot evalution results.

Blockchain As Private information Sharing Platform — Fordham, NY
Researcher Assistant — *Jan 2023 – Apr 2023, Part-time*
- Identify the pain point of lack use of privacy valuable data. Adopt blockchain concept for solution development.
- Design smart contract for data operation on the blockchain. Built user interface. Deployed as a web application.
- Discuss the feasibility of the system, security, and scalability issues. Future possibilities of the system.

Projects

Stock Price trend Prediction with Markov Chain — *Machine Learning, Apr 2022*
- Adopt discrete way of approaching continuous data. Calculating new attribute data with moving average.
- Expanding the small dataset by randomly combining numeric data using equal frequency binning.
- Create stochastic matrices(positive and negative) for prediction. Evaluate accuracy and recall on prediction.

Spotify Music Genre Classification Based on Sound Attributes — *Data Mining, Jan 2021*
- Clean data, perform KNN on one attribute each time as a way of classifying music in a recommendation system.
- Write report about classifying music with similarity in sound properties instead of music genre classes could enhance non-musician users experience because they tend to feel the music with sense instead of analyzing them.

Work Experience

ForChange Tech — ShenZhen, China
Data Anlayst — *Sep 2020 – June 2021*
- Work on 50k users classification task on company's online educational products, combining data science and psychological approaches to define the preference of users.
- design a user-analysis plan based on the need of understanding users' behavior in online learning situations. Apply k-means to group users, generating visualization presentations.
- Networking with different departments, and distributing results. Participate in designing how to capture users' demands in different dimensions. Provide data buried thoughts from psychological perspectives.

Skills

Programming: Python, JavaScript, C/C++, Shell Script, Git, SQL/NoSQL, Cloud Cluster

Libraries/framework: PyTorch, Scikit-Learn, NumPy, Pandas, Matplotlib, Seaborn, React, Astro

Communication: English (Fluent), Chinese (Native), Psychological Counseling Certificate