Mingyang Wei

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EDUCATION

Department of Computer Science, Emory University　　　　　Atlanta, USA
M.S. in Computer Science　　　　　2023 - 2025(Expected)

School of Cyber Science and Engineering, Wuhan University　　　　　Wuhan, China
B.E. in Information Security　　　　　2016 - 2020

PUBLICATIONS

1. Zewen Liu, Yunxiao Li*, **Mingyang Wei***, Guancheng Wan, Max S.Y. Lau, Wei Jin. EpiLearn: A Python Library for Machine Learning in Epidemic Modeling. *In KDD epi-DAMIK*, 2024.　　　　　*Equal Contribution

AWARDS

- **Bronze Prize**, Kaggle: Harvard Medical School Brain Activity Classification　　2024
- **Emory Computer Science Scholarship**, Emory University　　2023
- **Award for Students with Excellent Academic Performance**, Wuhan University 2019
- **Memorial Undergraduate Scholarship**, Wuhan University　　2018

EXPERIENCE

Emory Melody Lab | Atlanta, USA　　　　　2024.04 - Present
- Developed **EpiLearn**, a Python package for epidemic modeling using PyTorch, integrating various temporal and spatial models to analyze **time series data** in the field of **epidemiology**.
- Trying to apply **graph neural network attack** methods on surrogate models to control epidemic spreading.

Wuhan University | Wuhan, China　　　　　2019.11 - 2020.06
- Analyzed social media platforms to establish covert communication channels, extracted audio-visual data using **FFmpeg**, and evaluated the robustness of steganography techniques by examining changes in **QMDCT** coefficients and AV parameters.

SoC Workshop at National University of Singapore | Singapore　　2019.07 - 2019.08
- Developed a defense system against **NFC attacks** by researching attack methods, analyzing **IC card data structures**, and employing an **IPFS-based system** for secure identity authentication and real-time alerts.

PROJECTS

Harmful Brain Activity Classification
Emory University　　　　　2024.03 - 2024.04

- Investigated electroencephalography (EEG) data from critically ill patients, focusing on identifying harmful brain activity.
- Enhanced signal clarity using spatial and temporal preprocessing techniques, including the application of a **banana montage** for electrode setup and **Fast Fourier Transform** for frequency analysis.
- Engineered and trained advanced neural network models including **WaveNet, ConvFormer,** and **EEGNet** to classify EEG signals effectively.
- Improved model performance using advanced training strategies such as **dual-stage training, pseudo-labeling,** and **cosine annealing**.
- Obtained **bronze prize** in Kaggle competition.

Traffic Flow Prediction

Emory University   2023.11 - 2023.12

- Conducted a comprehensive analysis of the **time sequence** data and created an **adjacency matrix** for sensors that documented location data.
- Implemented a fusion of **graph convolutional network** and **Transformer**, mining temporal and spatial pattern.
- Conducted comparative analysis with **Long short-term memory (LSTM)**, and explored the effect of a sparse adjacency matrix and various hyperparameters.

Robust Watermark Algorithm Against Screen-Shooting Based on SIFT

Wuhan University   2020.04 - 2020.06

- Analyzed **distortion types** happening in photographs, i.e., **geometric distortion** and **moire fringe**, thus selected suitable **Scale-Invariant Feature Transform (SIFT)** points and a steganography domain.
- Realized a watermark embedding algorithm characterized to embed copyright watermark into target images snugly in **Discrete cosine transform (DCT)** domain.
- Restored photoed images to original picture with image correction algorithm based on **Canny boundary detection, edge tracing**, and **corner point mapping**.
- Conducted multidimensional test on the algorithm to see its performance including **noise attack** and an operable graphical interface of the system based on **VB .NET**.

SKILLS

Professionals: `Python`, `C`, `MATLAB`, `R`, `VB.NET`, `HTML`, `PHP`, `MySQL`.

Tools: Pytorch, Visual Studio, Wireshark, Nmap, Burpsuite, Metasploit, IDA, OllyDbg, X-ways Forensics, FFmpeg

Languages: Chinese, English

COMMUNITY ENGAGEMENT

Volunteer at Jiucaizhuang Village Government | Hohhot, China   2018.08
- Assisted in the daily business of the government, including statistics collection.
- Investigated the status quo of the left-behind children and interviewed them.

Secretary Office of Volunteer Association | Wuhan, China   2016.10 - 2018.05
- Organized and participated in various voluntary activities, including voluntary teaching and visiting the nursing home.
- Operated the WeChat official account and posted the records of activities that we held.

OTHERS

Interests: Table Tennis, Badminton, Singing, The League of Legends, K-pop, Hiking