

Mingyang Wei

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EDUCATION

Emory University, Atlanta, GA
Master of Science, Computer Science

May 2025

Wuhan University, Wuhan, Hubei, China
Bachelor of Engineering, Information Security

May 2020

Relevant Courses: Data structure, The Principle of Computer Organization, Operating Systems, Databases, Computer Networks, Network Programming, Software Engineering, Software Security, Network security

Awards: 2018 Memorial Undergraduate Scholarship, 2019 Award for Students with Excellent Academic Performance

PROGRAMMING SKILLS

Proficient at **Python, C, R, MATLAB, VB.NET, HTML, PHP, MySQL**

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

Academic Interests: **Software Programming, Machine Learning, Data Mining, Deep Learning, Attack & Defense, Software and Cyber security, AI+Security**

RESEARCH EXPERIENCE

Robust Watermark Algorithm Against Screen-Shooting Based on SIFT

Wuhan University

Apr. 2020 - Jun. 2020

- Studied effective robust watermarking algorithm screen shooting process for protection of ownership rights on digital images.
- Analyzed distortion types happening in photographing, i.e., geometric distortion and moire fringe, and selected suitable feature points and steganography domain.
- Realized a watermark embedding algorithm characterized to embed copyright watermark into target images snugly.
- Restored photoed images to original picture at a ratio of 1:1 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 and presented an operable graphical interface of the system.

Study on Steganography Algorithm Based on the Robustness of Audio and Video (AV) on Social Media

Wuhan University

Nov. 2019 - Mar. 2020

- Investigated various social media platforms with large user volume, including Weibo, Kuaishou and Ximalaya to find a covert channel to transmit information safely.
- Extracted videos and audios with ffmpeg and extracted the QMDCT coefficients of audios encoded with aac using FAAD.
- Compared the change of QMDCT coefficients using beyond compare/python script.
- Analyzed the changes of parameters of AVs to determine the steganograph space for large volume.

PROGRAMMING PROJECTS

Harmful Brain Activity Classification

Emory University

Mar. 2023

- 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.

Traffic Flow Prediction

Emory University

Nov. 2023

- Conducted a comprehensive analysis and preprocessing of Metr-LA dataset, dealing with the time sequence data and creating adjacency matrix for sensors that documented location data.
- Developed a graph convolutional network and captured spatial information embedded in the dataset.
- Implemented a fusion of graph convolutional network and Transformer using Pytorch and thus mined temporal pattern.
- Conducted comparative analysis with LSTM, and explored the effect of a sparse adjacency matrix and various hyperparameters.

Doppelganger Based on Near-field Communication (NFC)

SoC Summer Workshop, National University of Singapore

Jul. 2019

- Researched attack methods and principles aiming at NFC and designed a defense system accordingly.
- Analyzed partitions and sectors of different cards, studied and realized approaches to read M1 card.
- Employed IPFS distributed file system to record the hash values of each vector to achieve an identity authentication defense system that could defend attack approaches and issue alerts.

A Voice Assistant- Dian Xiao'er

Wuhan University

Jun. 2019

- Developed a voice assistant that could chat, search weather, set alarms, play music and inquire tickets.
- Used RASA framework to train the model to recognize users' intents.
- Defined the intents and entities of the text entered and defined actions and corresponding output text.
- Simulated the interaction between users and the assistant as the training story set of RASA to predict users' further actions.
- Activated RASA monitoring to finish the semantic recognition after the completion of model training.

Design of a Web-based Grades Management System

Wuhan University

Dec. 2018

- Realized a grades management system for students, including many functions like registration, personal information and revision of grades.
- Conducted the database tables and keys, as well as the dependency relationship therein with MySQL.
- Designed the websites of multiple functions, i.e., registration, input of grades, change of personal information.
- Achieved the functions for the administrator, such as recording and analyzing grade data and calculating average scores of classes and students, with PHP and MySQL.

LEADERSHIP AND COMMUNITY ENGAGEMENT

Volunteer at Jiucaizhuang Village Government

Hohhot, Inner Mongolia, China

Aug. 2018

- 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 the Youth Volunteer Association at CS Student Union

Wuhan, Hubei, China

Oct. 2016 - May 2018

- 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.

ADDITIONAL SKILLS AND INTERESTS

Languages: Chinese (Native), English (Professional Working)

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