Yifeng He

CONTACT INFORMATION

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RESEARCH INTERESTS

Program Analysis (Compilers, Type Theory, and Fuzzing), Code Understanding via Machine Learning & NLP, Programming Languages for Machine Learning & AI, Formal Verifiable Programs, Computer Security.

EDUCATION

University of California, Davis, Davis, California, USA 08/2019 – present

- **Anticipated degree:** B.S. in Computer Science & Applied Mathematics
- **GPA:** 3.879

RESEARCH

Computer Security Lab at UC Davis 10/2022 - present

- Work with one PhD candidate, researchers from Tencent AI Lab, and Prof. Hao Chen on the frontend of programming language embedding.
- Generate fuzzing data (program-level IO pairs) for fine-tuning (Fuzz-tuning) LLM and achieved SOTA on downstream tasks.
- Generate fuzzing data (program-level IO pairs) for pre-training (Fuzz-pretrain) LLM.
- Proposed new tasks for evaluating testcase generation by LLM.
- Instrument open-source projects to generate function-level fuzzing IO-pairs via LLVM Pass.

Path Academics 02/2022 - 07/2022

- Conducted research on neural network and its application in AI under the supervision of Prof. Pavlos Protopapas from Harvard
- Attended workshops on gradient descent algorithm, neural network optimizers, regularization of neural network, and other related concepts and architecture
- Analyzed and compared models of deep learning algorithms application,
- Made automatic differentiation to activation functions by hand, visualized receptive fields through max-pooling

PUBLICATIONS

Zhao, J., Rong, Y., Guo, Y., **He, Y.**, Chen, H. *Understanding Programs by Exploiting (Fuzzing) Test Cases*, Findings of Association for Computational Linguistics (ACL), 2023.

He, Y, *Big Data and Deep Learning Techniques Applied in Intelligent Recommender Systems*, IEEE 4th International Conference on Civil Aviation Safety and Information Technology (ICCASIT), 2022.

HONORS AND AWARDS

Citation for Outstanding Performance, Dept. Mathematics, UC Davis, 2023

Dean's Honor List, College of L&S, UC Davis, Fall 2019, Spring 2020, Spring 2021, Spring 2022

INTERNSHIP

ByteDance 04/2021 – 08/2021

Software Engineering Intern, Income Platform Team

- Used microservice tech to connect parts of the author income settlement bushiness
- Transformed author-relation data architecture design from relational database (SQL) to graph database (Gremlin) to allow better efficiency for the business model
- Refactored the income calculation control process with visitor design pattern using Python 3

Software Engineering Intern, **Xigua Video** Author Experience Team

- Created a data cleaner script with ORM to maintain the size and readability of online data settlement table
- Created the offline flow of Medium Video Encouragement Project for weekly data calculation
- Built the interface for frontend of web and mobile app to display the data visualization

PROJECTS

CourseReco 06/2022 – 09/2022

- Designed the overall system architecture
- Led the programming for API server and recommender engine
- Negotiated with the third-party provider, SchedGo, for data service
- Provided technical leadership to teammates

Music Genre Classifier 05/2022 – 06/2022

- Processed music samples into spectrogram by Short-time Fourier transform
- Designed the appropriate model (CNN) to classify spectrograms into category
- Analyzed the resulting model and test outputs with saliency maps

ImageOrientation 03/2022 - 04/2022

- Pre-processed image data by rotating them with random generated angles, and assigned these angles as label
- Designed the appropriate CNN for regression task, tested and improved the model
- Applied Hyper-parameter tuning based on train, validation, and tested results

Dcash-server 05/2021 - 07/2021

- Created a multi-threaded API server using C++ to allow users to create accounts to make deposit and transfer
- Used MySQL to store and maintain user data
- Made API calls to the Stripe API server to handle credit card information

Genshine Impact Gacha Analyzer 08/2021 - 09/2021

- Designed fetching process of gacha data from MiHoYo and categorized the process
- Stored data into local database automatically, wrote into excel for data analysis by option
- Generated text or graph visualization report from data analyze results

ACTIVITIES

HackerHub Club, UC Davis 07/2020 - present

Co-founder, President, Technical Officer

- Design and maintain a course recommendation system, CourseReco, for UC Davis students
- Organize and lead the Code Jam Competition on data visualization, AI, augmented reality and virtual reality, and machine learning
- Coach in introductory programming workshops, including Assembly, functional programming, recommender system, generative adversarial network, etc.