

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

- Ph.D. in Computer Science 09/2023 – present
- B.S. in Computer Science & Applied Mathematics 08/2019 – 06/2023

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
	<i>Software Engineering Intern</i> , Income Platform Team <ul style="list-style-type: none"> Used microservice tech to connect parts of the author income settlement business 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 	
	<i>Software Engineering Intern</i> , Xigua Video Author Experience Team <ul style="list-style-type: none"> 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
	<ul style="list-style-type: none"> 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
	<ul style="list-style-type: none"> 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
	<ul style="list-style-type: none"> 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
	<ul style="list-style-type: none"> 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
	<ul style="list-style-type: none"> 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.