

Rong Feng

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EDUCATION

The Pennsylvania State University

University Park, PA

B.S. in Computer Science

Minor in Supply Chain and Information Science of Technology

Expected Graduation, May 2026

- **GPA:** 3.59/4.00, *Dean's List* on 6 semesters
- **Related Coursework:** Data Structures & Algorithms, Computer Organization & Design, Sys Progmg, Mathematical Statistics I/II, Prog Lang Concepts, Object-Oriented Programming, Supply Chain Management, Statistics & Applications, Discrete Math, Oop With Web, Logic Comp Sci, Matrices, Multivariable Calc, Machine Learning & AI, Operating system, Intro to Theory Computation, AI, Intro Neural Net, Software Dsgn Meth

Preprints

Rong Feng; Vanisha Gupta; Vivek Patel; Viroopaksh Reddy Ernampati; Suman Saha.

“Can Large Language Models Simulate Symbolic Execution Output Like KLEE?” [arXiv:2511.08530](https://arxiv.org/abs/2511.08530)

Rong Feng; Suman Saha.

“Can LLMs Recover Program Semantics? A Systematic Evaluation with Symbolic Execution” [arXiv:2511.19130](https://arxiv.org/abs/2511.19130)

EXPERIENCE

Undergraduate Research Assistant (Directed by Prof. Suman Saha)

The Pennsylvania State University

Oct 2024 – Present

- **Can Large Language Models Simulate Symbolic Execution Output Like KLEE? (Oct 2024–May 2025)**
Led a research investigating whether LLMs can simulate symbolic execution outputs produced by tools like KLEE.
 - Researched program semantics and code security, focusing on deobfuscation, symbolic execution, and program equivalence.
 - Designed preprocessing pipelines to automatically insert symbolic variables into C programs and compile to LLVM bitcode for analysis.
 - Fine-tuned GPT-4o on a large dataset + KLEE artifacts to evaluate its ability to replicate path constraints and test case outputs.
 - Presented findings at the **2025 Penn State Undergraduate Exhibition**.
- **Can LLMs Recover Program Semantics? A Systematic Evaluation with Symbolic Execution (May 2025–Present)**
 - Independently designed and implemented a benchmark suite combining TUM Obfuscation Benchmarks, LLVM test suite, and algorithmic repositories with four obfuscation transformations: control-flow flattening, opaque predicates, arithmetic encoding, and branch encoding.
 - Fine-tuned multiple LLMs (GPT-4.1-mini, Codestral, Ministral) under baseline and KLEE-enhanced training configurations using SMT constraints, path statistics, and test cases.
 - Built evaluation pipelines for syntax, semantics, and code quality.
 - Performed cross-model and cross-transformation analysis, identifying performance bottlenecks and future research opportunities for LLM-assisted deobfuscation.
 - Presented findings at the **ICDS Symposium 2026**.
- **Verified Program Transformation Using LLMs (May 2025–Present)**
Co-author of research manuscript on applying large language models to verified compiler transformations in LLVM IR (**under review** at a peer-reviewed conference).
 - Led experimental evaluation, benchmarking compiler transformations across the LLVM test suite.
 - Measured performance impact using runtime analysis and binary size metrics under multiple optimization settings.
 - Performed result analysis and visualization, identifying patterns in optimization behavior and model reliability.

Tennis Instructor (Summer 2023 & Summer 2024)

Shanghai, China

- Promoted and coordinated adult tennis lessons, managing scheduling and client communication.
- Tailored instruction for varied skill levels to ensure engaging, effective sessions.
- **PTR Level 1 Certified Tennis Coach** (Professional Tennis Registry, Apr 2025)

Software Developer Intern (*Summer 2025*)

Shanghai Meditation Network Technology Co., Ltd. – Shanghai, China

- Contributed to software feature development, implementing and refining application functionality.
- Assisted with basic system maintenance and troubleshooting to ensure stable operation of internal systems.
- Provided technical support for development tasks, debugging issues and improving code reliability.
- Demonstrated strong responsibility, adaptability, and effective collaboration in a fast-paced setting.

PROJECTS

AI-Driven Obsolete Part Replacement System (Capstone)

B.Braun Medical / The Pennsylvania State University

Aug 2025 – Present

- Designed and developed an AI-powered web platform to identify verified replacement options for obsolete manufacturing parts, minimizing machine downtime in an industrial setting.
- Collaborated with cross-functional teams at B. Braun Medical to gather requirements, iterate prototypes, and ensure alignment with real-world manufacturing needs.
- Developed both frontend and backend systems with user authentication, improving accessibility and deployment within factory environments.
- Strengthened teamwork, communication, and problem-solving skills through weekly reporting, stakeholder feedback, and coordinated project delivery.

Statistical and Deep Learning Models for Multi-Class Classification

The Pennsylvania State University

Aug 2025 – Present

- Implemented a full classical-to-modern ML pipeline, including Maximum Likelihood Estimation, Gaussian Bayesian classification, and Perceptron learning, using NumPy and Pandas on multi-class datasets.
- Estimated class priors, means, covariance matrices; constructed discriminant functions; and visualized decision boundaries, confusion matrices, and misclassified examples.
- Designed and trained neural networks on the MNIST dataset using PyTorch, including a Multilayer Perceptron (MLP) and a custom Convolutional Neural Network (CNN) achieving 98%+ test accuracy.
- Conducted hyperparameter tuning experiments (learning rate, batch size, network depth, hidden sizes), analyzed training dynamics, and compared generalization behavior between classical statistical models and deep learning architectures.

SportConnect - Social Media Mobile Application

Personal Project

May 2025 – Present

- **Technologies:** React Native, Expo, TypeScript, AWS (DynamoDB, Lambda, API Gateway, S3, WebSocket), Node.js, Git
- Architected real-time messaging system using AWS API Gateway WebSocket and Lambda functions with automatic reconnection logic and dual persistence (WebSocket + DynamoDB) for guaranteed message delivery.
- Engineered location-based user discovery and privacy-first sharing.
- Designed scalable NoSQL database with many DynamoDB tables, Global Secondary Indexes for efficient queries, and cascading deletion logic for data integrity across users, posts, and social relationships.
- Implemented optimistic UI updates with React Context API and intelligent multi-layer caching (memory + AsyncStorage) for responsive offline-first user experience.

Linear Device Project

The Pennsylvania State University

Jan 2024 – May 2024

- Developed a linear device using C language in a virtual machine during sophomore year. Implemented functions such as write, read, and search. Enhanced the project by adding cache for better memory allocation and speed improvement, and finally added networking features.

Malloc Lab

The Pennsylvania State University

Jan 2025 – May 2025

- Implemented a custom dynamic memory allocator in C for managing heap memory, simulating malloc, free, and realloc functions. Utilized explicit free lists, boundary tag coalescing, and block splitting techniques to maximize throughput and minimize fragmentation. Gained in-depth understanding of low-level memory management, pointer arithmetic, and system-level debugging.

SKILLS

Programming: Python, Java, C, JavaScript, TypeScript, HTML/CSS, MySQL/SQL, React.js, React Native

AI & Machine Learning: TensorFlow, PyTorch, Scikit-learn, NumPy, Pandas, Matplotlib, LoRA

Language: English, Mandarin