Mohammad Jalili Torkamani

contact@mjalili.com | MJalili.com | GitHub/MJaliliT | Linkedin/MJaliliT

SUMMARY

Software engineer and Computer Science Ph.D. candidate with hands-on experience building AI-powered applications, backend services, and developer tools using Python and Java. Built LLM-driven and static-analysis pipelines spanning 500+ open-source repositories, 10M+ lines of code, and 50K+ vulnerability records. Experienced in LLM fine-tuning, API development, data processing, automated evaluation, and production-oriented software engineering.

EDUCATION

Ph.D., Computer Science — **Jan 2024 – Exp. Dec 2028**
University of Nebraska–Lincoln (UNL) — GPA: 3.9/4.0

M.S., Computer Science — **Jan 2024 – Dec 2025**
University of Nebraska–Lincoln (UNL) — GPA: 4.0/4.0

B.S., Computer Engineering — **Sep 2016 – Sep 2020**
K. N. Toosi University of Technology (KNTU)

SKILLS

Programming: Python, Java, C/C++, Bash, SQL

Software Engineering: Data Structures, OOP, System Design, Static Analysis, Unit Testing, CI/CD, Git

Machine Learning & LLMs: PyTorch, Hugging Face Transformers, LoRA/QLoRA, RAG, LangChain, LlamaIndex

Backend & Data: FastAPI, REST APIs, PostgreSQL, MongoDB, Redis, Celery, Kafka

Infrastructure: Docker, AWS, Linux, Nginx

EXPERIENCE

Research Assistant — **Jun 2026 – Jul 2026**
University of Nebraska–Lincoln

- Engineered custom Python and Java framework to mine and analyze 500+ open-source repositories, processing 10M+ lines of code utilizing static analysis and abstract syntax trees (AST).
- Fine-tuned and benchmarked open-source LLMs (Llama-3, Mistral) using QLoRA, achieving 100% assertion-generation accuracy and reducing inference latency by 45 ms.
- Automated evaluation and execution workflows by designing reproducible CI/CD pipelines, cutting validation time for code-analysis experiments by 30%.

Research Assistant — **Jan 2024 – Dec 2025**
University of Nebraska–Lincoln

- Developed Python- and Java-based frameworks for automated software vulnerability identification, CWE classification, CVSS severity prediction, and vulnerability report generation using LLMs.
- Designed modular and scalable data-processing pipelines for CVE/CWE datasets, enabling security analysis across 50K+ vulnerability records.
- Benchmarked open-source LLMs using Few-Shot and CoT prompting, optimizing CWE prediction accuracy by 14%.
- Automated benchmarking and evaluation pipelines for statistical analysis, model comparison, and reproducible vulnerability prediction experiments.
- Collaborated with interdisciplinary research teams on AI-driven software security, vulnerability, and program analysis research.

Software Engineer — **Apr 2022 – Jul 2022**
Arzyaban Salamat Pars Company

- Architected and deployed a production-grade internal enterprise web application using FastAPI and PostgreSQL, handling concurrent workflows for hundreds of daily active users.
- Designed and optimized relational database schemas and implemented asynchronous background tasks with Celery and Redis, reducing API response times by 25%.

Software Engineer **Oct 2018 – May 2020**
Medreek (Ayandeh Sazan) Publication

- Developed an AI-assisted Android application for personalized study planning targeting high-school students.
- Implemented recommendation logic and mobile application features using Java and Android SDK.
- Optimized application usability to improve the student learning experience.

Co-founder and Technical Instructor **Oct 2016 – Oct 2019**
SeedS/Lexeen Software Startup

- Led hands-on workshops on neural networks, introducing 10+ undergraduate students to ML concepts and model development.
- Designed and delivered Android application development workshops using Java for approximately 20 undergraduate students.
- Mentored students in software design, debugging, and mobile application development through project-based learning.

Software Engineering Internship **Jul 2019 – Sep 2019**
Sarmad Insurance

- Developed an Android application for calculating insurance premiums based on business rules provided by Sarmad Insurance.
- Implemented premium calculation logic and intuitive user interfaces using Java and Android SDK.
- Worked closely with company engineers to validate business rules and application functionality.

SELECTED PROJECTS

CASEY – LLM-assisted CWE identification, severity assessment, and vulnerability description generation

- Engineered a Python-based framework for automated software vulnerability understanding, including CWE classification, CVSS severity prediction, and vulnerability report generation using LLMs.
- Benchmarked LLMs across fine-tuning strategies and source-code granularity levels for software vulnerability analysis.
- Designed modular, reusable pipelines for automated vulnerability analysis, evaluation on thousands of vulnerabilities, and reproducible experimentation.

ASSERTIFY – LLM-Based Production Code Assertion Generator

- Designed an automated framework for generating assertions from Java source code using LLMs and structured prompting.
- Integrated JavaParser-based static analysis, compilation, and automated test execution into a unified assertion validation pipeline.
- Implemented reusable Python and Java components supporting reproducible AI-assisted software quality workflows.

ACCENTO – Accent-Based YouTube Filter Backend Service

- Developed a containerized backend using FastAPI, MongoDB, Redis, Celery, and Docker with modular service architecture.
- Implemented asynchronous AI pipelines combining text analysis and audio-based accent classification.
- Integrated JWT, Redis caching, Pydantic validation, and environment-based configuration for production deployment.

TICKETIFIER – AI-Powered Support Ticket Backend

- Engineered a production-grade backend using FastAPI, MongoDB, Redis, Celery, Docker, and LangChain.
- Integrated LLM-powered ticket summarization, categorization, and response generation through async background workers.
- Designed modular backend APIs for ticket lifecycle management and asynchronous AI inference.

ENTREPRENEURIAL LEAD

NSF I-Corps Entrepreneurship Program | Lincoln, NE

- Actively conducting market validation and customer discovery for AI4SE SaaS solutions, interviewing industry stakeholders to transition advanced lab research into enterprise products.

SELECTED RESEARCH

- **M.J. Torkamani**, A. Sharma, N. Mehrotra, R. Purandare, ”Automatic Generation of Java Production Assertions Using Large Language Models.”, *ACM Transactions on Software Engineering and Methodology*, (*Under Review*)
- **M.J. Torkamani**, N. Mehrotra, M. Rashedul Hasan, H. Bagheri, B. Sharif, R. Purandare, ”The Impact of Code Granularity on LLM-Based Vulnerability Understanding: CWE Identification, Severity Assessment, and Description Generation.”, *IEEE Transactions on Software Engineering*, (*Under Review*)
- **M.J. Torkamani**, J. Ng, N. Mehrotra, M. Chandramohan, P. Krishnan, R. Purandare, ”Streamlining security vulnerability triage with large language models.”, arXiv:2501.18908