Hossein Zangooei, Ph.D.

Senior Software Engineer | IAM, Backend, Cloud, Data/AI

CONTACT

Plano, TX

mhzangooei@gmail.com

LinkedIn

Google Scholar

EDUCATION

Ph.D., Computer Engineering
Sharif University of Technology
2012 - 2017

M.Sc., Computer Engineering
Tarbiat Modares University
2009 - 2011

B.Sc., Computer Engineering
Bahonar University
2004 - 2009

IDENTITY / SECURITY

OAuth 2.0 | OIDC | Okta | Entra ID | JWT | Cookie Auth | RSA/RS256 | Azure Key Vault | PKCE | State | Nonce | RBAC | Entity Permissions | B2B Token Exchange

BACKEND / CLOUD

C# | .NET 8 | ASP.NET Core | Java | Python | C++ | MediatR | CQRS | EF Core | SQL Server | REST | GraphQL | Swagger | Azure | AKS | Kubernetes | Docker | CI/CD | RabbitMQ

DATA / AI

Machine Learning | Deep Learning | Computer Vision | Feature Engineering | Classification | Deep RL | Multi-Agent Modeling | Image Processing | Pandas | PySpark | ETL

TESTING / TOOLS

xUnit | Moq | JUnit | Mockito | Postman | JMeter | Rider | Visual Studio | IntelliJ | Git | Bitbucket | Jira | Linux | Maven | Ansible

PROFESSIONAL SUMMARY

Senior Software Engineer with a Ph.D. in Computer Engineering and 15+ years of experience building secure backend platforms, enterprise identity systems, automation services, data/AI solutions, and machine learning applications. Strong background in software architecture, distributed systems, software design patterns, machine learning, and applied AI, with hands-on experience in REST/GraphQL APIs, CQRS/MediatR, cloud-native deployment, and runtime configuration management. Experienced in research-driven development, machine learning model development, data engineering pipelines, ETL workflows, and AI-based solutions. Recent focus: User Management System (UMS), Okta and Microsoft Entra ID integration, OAuth 2.0/OIDC flows, JWT/cookie security, RSA signing and validation, Azure Key Vault, and deployment on Azure/Kubernetes.

Senior Software Engineer

04/2023 - Present

Helmerich & Payne

Dallas/Remote, TX

- Designed and implemented a centralized User Management System for enterprise users, roles, permissions, identity providers, and entity-level access control across business applications.
- Integrated Okta and Microsoft Entra ID using OIDC/OAuth 2.0 patterns; supported login, callback, logout, refresh token, session status, and secure cookie/JWT authentication flows.
- Built B2B/service-to-service token exchange and validation, including client assertion validation, subject-token/OBO support, actor/client claims, issuer/audience checks, and secure downstream token generation.
- Implemented RSA/RS256 signing and validation with Azure Key Vault, enforcing JWT `kid` parsing, signature validation, key-name mapping, vault-name validation, and dynamic signing-key resolution.
- Improved reliability through runtime configuration refresh and local RSA public-key caching with TTL, reducing repeated Azure Key Vault reads and removing restart dependency for supported DB-backed AppSettings.
- Developed REST and GraphQL APIs using ASP.NET Core, .NET 8, EF Core, MediatR/CQRS, Swagger/OpenAPI, and SQL Server to expose users, groups, permissions, identity-provider data, and authorization rules.
- Supported Azure/Kubernetes deployments, CI/CD pipelines, database schema deployment, environment-specific seed data and troubleshooting logs
- Engineered Java/Maven services for RSS Downlink Management and drilling automation workflows, including control-message processing, rig status updates, downlink command generation, command synchronization, and RabbitMQ-based asynchronous messaging.
- Maintained and enhanced build and delivery assets using Maven, YAML configuration, AsyncAPI/YAML code generation, Bitbucket version control, Linux, Docker, Ansible, JUnit, Mockito, Jackson, and Spring-based Java components.
- Collaborated with product owners, architects, QA, and infrastructure teams to refine IAM requirements, improve observability, resolve production issues, and deliver secure platform capabilities for internal product teams.

Data Engineer

05/2022 - 04/2023

Philips Corporation

Remote/Hybrid

- Developed PySpark and Python data pipelines on Linux to collect, transform, validate and prepare patient monitoring data for automated prediction, analytics, and clinical decision-support workflows.
- Designed ETL processes to integrate clinical data from multiple sources into centralized SQL Server databases, improving data accessibility for downstream machine learning models, debugging tools, and reporting needs.
- Supported research-driven development by analyzing patient monitoring signals, improving prototype algorithms, and preparing clean datasets for model evaluation, validation, and performance review.

- Collaborated with internal teams, external stakeholders, and clinical domain experts to define software requirements, document technical solutions, optimize prototypes, and support HIPAA-aware PHI de-identification practices.

Algorithm Engineer 01/2022 - 05/2022

KLA Corporation Milpitas, CA / Remote

- Developed and optimized C++ and Python algorithms for semiconductor wafer inspection, defect detection, image analysis, and pattern recognition.
- Applied computer vision, image-processing, and machine-learning techniques to identify and classify defects in semiconductor inspection data.
- Evaluated algorithm performance using production and experimental datasets, investigated detection errors, and improved accuracy and computational efficiency.
- Collaborated with algorithm, software, and domain engineering teams to translate semiconductor inspection requirements into production-ready algorithm improvements.

Research Associate 06/2019 - 01/2022

University of Texas at Dallas Richardson, TX

- Developed computational models and software pipelines for cancer growth simulation using micro-CT imaging, image processing, deep learning, reinforcement learning, feature extraction, and multi-agent modeling.
- Built and evaluated machine-learning and computational modeling approaches for analyzing biomedical imaging data and predicting tumor and microvascular growth patterns.
- Processed and analyzed large biomedical imaging datasets to extract quantitative features, characterize microvasculature topology, and prepare data for modeling and simulation.
- Collaborated with interdisciplinary researchers on AI-driven biomedical research, experimental analysis, scientific software development, and peer-reviewed publications.

Software AI Engineer 06/2016 - 06/2019

PDN Company Tehran, Iran

- Developed real-time automatic license plate recognition software using C#, computer vision, image processing, OCR, and machine-learning techniques.
- Built image-processing pipelines for vehicle and license-plate detection, image enhancement, character segmentation, recognition, and classification.
- Developed backend components and SQL-based data workflows for storing, retrieving, and processing vehicle and license-plate recognition data.
- Tested and optimized recognition algorithms for varying lighting conditions, camera angles, image quality, and real-world traffic environments.

Research Scholar 10/2015 - 05/2016

Arizona State University Tempe, AZ

- Developed pharmacodynamic simulation and predictive modeling frameworks using agent-based modeling, ordinary/partial differential equations, cellular automata, computational biology, and machine learning-inspired simulation techniques.

SELECTED PUBLICATIONS

- **Scientific Reports (2021):** Multiscale computational modeling of cancer growth using features derived from microCT images.
- **Annals of Operations Research (2024):** Handling of uncertainty in medical data using machine learning and probability theory techniques: A review of 30 years.
- **Computer Methods and Programs in Biomedicine (2012):** Hepatitis disease diagnosis using a novel hybrid method based on support vector machine and simulated annealing (SVM-SA).
- **Knowledge-Based Systems (2016):** Coronary artery disease detection using computational intelligence methods.
- **PLOS ONE (2017):** Hybrid multiscale modeling and prediction of cancer cell behavior.
- **Applied Soft Computing (2015):** Source code and design conformance, design pattern detection from source code by classification approach.
- **Knowledge-Based Systems (2012):** PSSP with dynamic weighted kernel fusion based on SVM-PHGS.

CORE STRENGTHS

Platform Engineering | Backend Architecture | IAM Architecture | API Design | Security | Cloud Deployment | Machine Learning | Applied AI | Computer Vision | Data Engineering | ETL Pipelines | Research-Driven Development | Test Automation | Cross-team Delivery

AWARDS

- USFC Research Scholarship, ASU ACIMS
- 1st Rank among M.Sc./Ph.D. Software Engineering students
- 1st Place, Iranian Data Mining and Pattern Recognition Match

PATENT

System for determining the need for angiography for patients with symptoms of coronary artery disease, Iran, July 2013.