Howard (Hao) Ye

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SUMMARY

Graduate software engineer with dual Master's degrees and hands-on experience building cloud-native applications with microservices architecture. Strong foundation in distributed computing, full stack development, and DevOps practices with proven ability to design, develop, and deploy scalable cloud solutions. Passionate about leveraging cutting-edge technologies to solve complex technical challenges.

TECHNICAL SKILLS

Programming Languages: Python, JavaScript/TypeScript, Java, C/C++, SQL
Cloud & DevOps: AWS (EC2, S3), Docker containerization, CI/CD pipelines, automated testing
Backend Development: Node.js, FastAPI, RESTful APIs, microservices architecture, GraphQL
Frontend Development: React, TypeScript, modern HTML5/CSS3, responsive design
Databases: PostgreSQL, Redis, database design and optimization
AI/ML: PyTorch, LangChain, scikit-learn, XGBoost, machine learning model integration
Development Practices: Agile methodology, design thinking, testing & automation, security-first mindset

EDUCATION

MS Computer Engineering — University of Tennessee Knoxville — 2025
MS Industrial Engineering — University of Tennessee Knoxville — 2016

TECHNICAL PROJECTS

Cloud-Native Distributed Application Platform

GitHub: github.com/yehao622/hpc-simulation-platform — **Live:** AWS EC2 Deployment
Tech Stack: Docker, Node.js/TypeScript, Python/FastAPI, PostgreSQL, Redis, React, AWS, Prometheus/Grafana

- Architected cloud-native microservices platform with containerized services enabling scalable distributed computing across multiple nodes
- Designed and implemented RESTful API gateway with comprehensive endpoints for service orchestration, data management, and system monitoring
- Built robust backend services using Node.js and Python FastAPI with event-driven architecture and real-time WebSocket communication
- Developed PostgreSQL database layer with optimized schemas, complex relationships, and efficient query patterns for high-throughput operations
- Implemented full stack solution with React frontend providing interactive dashboards and real-time data visualization
- Established DevOps practices with Docker containerization, automated testing frameworks, and comprehensive health monitoring
- Deployed production system on AWS EC2 with proper security configurations, monitoring integration, and operational best practices
- Created enterprise-grade observability stack with Prometheus metrics collection and Grafana dashboards for system performance tracking

AI-Powered Backend Services Integration

Tech Stack: Python, LangChain, OpenAI API, ChromaDB, FastAPI, Docker

- Developed AI service microservice integrating LangChain framework with vector database for intelligent data processing
- Built RAG (Retrieval-Augmented Generation) system with ChromaDB vector store for semantic search and context retrieval
- Implemented FastAPI backend with comprehensive REST endpoints for AI model interaction and data pipeline management
- Created automated deployment workflows with Docker containerization ensuring consistent service execution environments

- Designed cross-service communication patterns enabling AI analysis of distributed system data with proper error handling

Real-Time Event-Driven Optimization System

Demo: smart-home-energy-demo.vercel.app — **Tech:** Python, Docker, Node.js, PostgreSQL

- Built event-driven microservices architecture with real-time data processing pipelines and automated decision execution
- Developed reinforcement learning model deployment system with continuous optimization and performance monitoring
- Implemented RESTful APIs for data ingestion, model control, and result visualization with comprehensive error handling
- Created real-time monitoring dashboards with Chart.js for tracking system metrics and optimization performance
- Deployed containerized services with Docker ensuring reproducible environments and simplified scaling

Machine Learning Model Development & Deployment

Tech: PyTorch, Transformers, XGBoost, LightGBM, CatBoost, Optuna, scikit-learn

- Fine-tuned transformer models (DeBERTa-v3-base) for multi-class classification with custom training pipelines and evaluation frameworks
- Built ensemble regression models with advanced feature engineering and automated hyperparameter optimization using Optuna
- Developed comprehensive data preprocessing pipelines for feature extraction, normalization, and transformation operations
- Implemented model evaluation frameworks with metrics tracking, performance analysis, and automated testing
- Created reproducible ML workflows with proper versioning, documentation, and deployment readiness

Java Spring Boot Analytics Microservice

Tech: Java, Spring Boot, Maven, Docker, RESTful APIs

- Developed enterprise Java microservice with Spring Boot framework providing comprehensive analytics APIs
- Implemented RESTful endpoints with proper error handling, input validation, and security best practices
- Integrated service with multi-language microservices architecture enabling cross-platform communication
- Created Docker containerization with health checks and proper configuration management for production deployment

KEY COMPETENCIES

Cloud-Native Development: Extensive experience designing and deploying distributed applications with microservices architecture, containerization, and cloud infrastructure

Full Stack Proficiency: Comprehensive skills spanning backend services (Node.js, Python, Java), frontend development (React, TypeScript), and database management (PostgreSQL, Redis)

DevOps & Automation: Strong foundation in CI/CD practices, automated testing frameworks, container orchestration with Docker, and system monitoring

Problem-Solving: Demonstrated ability to architect scalable solutions, debug complex distributed systems, and optimize performance across the full application stack

Continuous Learning: Rapid technology adoption with proven track record integrating cutting-edge tools including AI/ML frameworks, modern cloud services, and emerging development practices

Collaboration: Experience working across multiple technology domains, integrating diverse services, and following agile development methodologies