Sewon Park

Senior Research Engineer

Suprema Inc.

EDUCATION

Ph.D. in Applied Artificial Intelligence *Mar. 2026 - Present*

Sungkyunkwan University, Seoul, Korea

M.S. in Applied Data Science *Sep. 2019 - Aug. 2021*

Sungkyunkwan University, Suwon, Korea

Thesis: "Prediction of Blue House National Petition Response Targets Considering Data Imbalance"

B.S. in Maritime Police System *Mar. 2010 - Feb. 2017*

Gyeongsang National University, Jinju, Korea

RESEARCH INTERESTS

- Large Language Models (LLM) and Multi-Agent Systems
- Artificial Intelligence and Data Science
- Quantum Machine Learning (QML) and Quantum Neural Networks (QNN)
- Social Network Analysis and Sentiment Propagation Dynamics
- Distributed Systems and Microservices Architecture

RESEARCH EXPERIENCE

Senior Research Engineer *Feb. 2021 - Present*

BSS Development Team, Suprema Inc., Korea

- Leading AI agent development and backend architecture for enterprise access control solutions
- Specializing in NLP, deep learning, prompt engineering, and MCP-based multi-client architecture
- Managing team of 3 interns for LLM-based automated testing solutions

Research Engineer *Apr. 2020 - Jan. 2021*

R&D Department, HBrain Inc., Korea

- Developed Smart AI traffic control services using radar and camera sensor fusion
- Participated in government projects (Ministry of Interior, Ministry of Land)

Software Developer *Oct. 2018 - Feb. 2020*

Development Team, AtData Inc., Korea

- Contributed to SK Telecom TANGO 5G Project for web development and system maintenance
- Developed IP configuration and transmission network management web applications
- Implemented raw data analysis processing and Jenkins-based automated deployment

SELECTED PROJECTS

Quantum ML-based Stablecoin Depegging Prediction Research (Personal Research) *Jul. 2025 - Ongoing*

Investigating whether sentiment analysis performed in quantum ML's 2^n-dimensional Hilbert space outperforms classical ML's n-dimensional Euclidean space for stablecoin depegging prediction. Collected 7M+ Reddit posts and 2,246 news articles covering major events (LUNA collapse, FTX crisis, SVB crisis). Conducting comparative analysis across GPU vs QPU simulator vs NISQ hardware, implementing QNN for sentiment analysis and comparing with traditional models (VADER, XGBoost).

Technologies: Python, Qiskit, PennyLane, QNN, QSVM, Reddit API, Network Analysis, VADER, XGBoost

Multi-Agent AI System Development with MCP Architecture (Suprema) *Feb. 2025 - Ongoing*

Designed and implemented comprehensive AI agent ecosystem including BioStar Copilot (product assistant) and Solis (internal support agent). Built MCP-based architecture supporting 80+ API tools with multi-client integration (BioStar X UI, Claude Desktop, WhatsApp Mobile). Currently transitioning to full multi-agent orchestration system for scalable AI services using function-calling and tool-based orchestration.

Technologies: Python, LLM, LangGraph, MCP, React, NLP, RAG, Prompt Engineering, Multi-Agent Architecture

LLM-based Automated Unit Test Generation System (Suprema) *Feb. 2025 - Jun. 2025*

Led team of 3 interns to design LLM-based agent for automated backend/frontend unit test generation. Architected GitLab PR integration with MCP server and developed MCP client similar to Claude Desktop. Successfully deployed to internal development teams.

Technologies: Python, Java, LLM, LangGraph, Agentic RAG, GitLab CI/CD, Jacoco

Spring Cloud MSA Architecture Migration (Suprema) *May 2024 - Oct. 2024*

Transformed monolithic application to microservices architecture using Spring Cloud Gateway, implementing Circuit Breaker, Rate Limiter, and dynamic routing. Upgraded to SpringBoot 3.4.4 and JDK 21.

Technologies: Java, Spring Cloud, MSA, Kubernetes

Distributed Event Processing System (Suprema) *Jan. 2023 - Apr. 2023*

Enhanced real-time event log service performance using Apache Ignite and Zookeeper for distributed processing. Achieved significant performance improvements in handling concurrent device connections.

Technologies: Java, Apache Ignite, Zookeeper, gRPC, RabbitMQ

AWS Cloud Integration for Remote Enrollment (Suprema) *Jul. 2021 - Oct. 2021*

Implemented serverless architecture for remote user registration using AWS Lambda and S3, enabling automated distribution and reducing operational costs.

Technologies: AWS Lambda, S3, REST API, Python

PUBLICATIONS & PRESENTATIONS

- HBrain, "Development of AI traffic safety element technology and integrated system", The Korean Society of Intelligent Transport Systems, Jeju, Korea (Oct. 2021) - Oral Presentation

TECHNICAL SKILLS

Programming Languages: Python, Java, JavaScript, TypeScript, C++, Kotlin, SQL

AI & Machine Learning: LLM, NLP, Deep Learning, PyTorch, TensorFlow, Keras, RAG, Agentic RAG, LangGraph, MCP, Prompt Engineering, QML, QNN, QSVM

Frameworks & Tools: Spring Framework, Spring Cloud, React, Angular, Node.js, FastAPI, Django

Databases & Infrastructure: MySQL, MSSQL, MariaDB, PostgreSQL, Redis

Data Analysis & Research: Network Analysis, Sentiment Analysis, Time Series Analysis, Statistical Modeling, Qiskit, PennyLane, VADER

Cloud & DevOps: AWS (Lambda, S3, EC2), Docker, Kubernetes, Jenkins, GitLab CI/CD

Architecture & Methodologies: Microservices (MSA), Agent Orchestration, Distributed Computing, RESTful API, gRPC, Test Automation, Agile/Scrum

LANGUAGES

- Korean: Native
- English: Intermediate (TOEIC Speaking 130)

MILITARY SERVICE

Republic of Korea Army, Completed mandatory service (Jun. 2012 - Mar. 2014)