# **Project Portfolio: Jeayoung Jeon**

MLOps/DevOps and Al Engineer (Updated at 2024-12-01)

NOTE

My name is Jeayoung Jeon [전제영], and I'm an MLOps engineer in Seoul, South Korea. I also specialize in:

- We Developing MLOps (APIs, Pipelines) and AI/LLM Platforms in cloud-native environments.
- 🙎 Building Hybrid Kubernetes Clusters for High Availability and GPU Cost Reduction.
- 💆 Contributing decisions for MLOps/DevOps using backgrounds in ML, Computer Vision, Automotive.

I'm always open to new challenges and opportunities for various fields including **Automotives** and **AI**. Please feel free to contact me. If you're looking for my brief resume and works, please see my **resume** (https://jyje.live/profile/resume) and **portfolio** (https://jyje.live/works).

#: https://jyje.live

Work

in : LinkedIn: jyje (https://www.linkedin.com/in/jyje)

Github (http://github.com/jyje)

StackShare (https://stackshare.io/jyje/jyje-pro-

stack)

Mar 2024 – Nov 2024 (9 Months)

🧏 Intermediate Software Engineer [책임연구원] at MAXST (https://maxst.com/ENG/main)

Roles: Lead MLOps/DevOps Engineer at Technology Division, MAXST

- MLOps Developing ML APIs, data pipelines, and AI Platforms for research team using open sources.
- LLMOps Building chatbots using self-hosted RAG+LLM systems for internal documents.
- SRE Site reliability engineering for web services. Service reliability engineering for ML workloads.

Jan 2021 – Feb 2024 (3 Years and 2 Months)

🧸 Software Engineer [선임연구원] at MAXST (https://maxst.com/ENG/main)

Roles: Associate Researcher and DevOps Engineer at Technology Division, MAXST

- Algorithm Research Reviewing computer vision algorithms in state-of-art papers and implementing prototypes
- Hybrid Clusters Building hybrid clusters with AWS EKS and on-premise Kubernetes for digital twin project
- DevOps Building on-premise clusters and data pipelines for company's inbound/outbound projects

Mar 2012 - Aug 2020 (8 Years and 6 Months)

Graduate Student Researcher in Computer Vision at POSTECH (https://eee.postech.ac.kr/)

Roles: Ph.D Integrated Student at Department of Electrical Engineering, POSTECH

- Computer Vision Research on hyperparameters for accurate and efficient computer vision algorithms
- Automotives Principal computer vision technologies for autonomous driving including ADAS and SLAM; Participated in the development of the Korean government's ADAS research projects
- FPGA Efficiently implemented computer vision and machine learning algorithms with real-time parallel matrix processing; SoC-type GPU/NPU accelerator

Projects 🖨

Jan 2024 - Oct 2024 (10 Months)

#### Midearth: Digital Twin & AR Content Platform at Widearth, MAXST (https://widearth.world)

Roles: Lead ML/Infra Roles ~ MLOps/DevOps + ML Backend + SRE [contrib 75%]

- DevOps & SRE IaC, GitOps, CI/CD Pipelines, Monitoring, Logging, Notifications, Multi-Deployment, Emergency Response
- Hybrid Clusters Public Cloud + On-Premise Kubernetes, API Gateway Pattern, Dynamic VMs, GPU Cost Optimization
- ML Workloads ML APIs, ML Pipelines, Data Lakes, Dockerizing, Model CI/CD

#### Results: Service Launch ~ Small Team, Full Features, More Availability, Less Cost

- Launch Launched/Operated a platform as 1 infra engineer with 15 people, 8 developers in 10 months.
- Low Cost Reduced cloud costs by 15M KRW (70%) by using hybrid clusters for 300+ maps.
- Robust Infra Achieved 96% availability/year and 14d downtime using hybrid clusters and damage control.

#### Skills: Skill Stack for Project Widearth

AWS EKS Kubespray Python/FastAPI Argo Workflows Argo CD Bitbucket Pipelines Karpenter

Jan 2024 - Jun 2024 (6 Months)

# 🙎 MLOps: On-Premise MLOps with Open Source Projects at MAXST (https://maxst.com/ENG/main)

Roles: Lead MLOps Engineer ~ Planning + VoC + PoC + ML Workloads/Infra + Operation [contrib 90%]

- Kubeflow Integrated Argo Workflows; AutoML, Distributed Training, Model Registry; 16 GPUs Acceleration
- JupyterHub Integrated JupyterHub with IDE; Remote GPU Notebook, 4 GPUs Acceleration
- VectorDB Milvus, ChromaDB, RAG+LLM Chatbot
- ML Infra Setup CI/CD, NAS, Data Lake, Image Registry for ML Workloads

#### Results: Improved research environment and resource management ~ Increased availability and capacity by merging resources and automating management.

- Improved Env. Consolidated servers managed by researchers into k8s to stable infra capacity and stability; Decision-making using PoC.
- Al Platform Expanded from VoC of 2 researchers, gradually increased users to 10. Resolved technical debt through continuous MLOps upgrades.
- GPU utilization

  GPU usage increased by 3 times and successfully commercialized as a result of performing over 800 AutoML experiments

# Skills: Skill Stack for On-Premise MLOps

 (Kubeflow)
 (Katib)
 (Training Operator)
 (Model Registry)
 (JupyterHub)
 (Argo Workflows)
 (Milvus)
 (ChromaDB)
 (Ollama)
 (Open WebUl)
 (Grafana Stack)

 (TensorBoard)

Dec 2022 - Dec 2023 (13 Months)

# DevOps: Hybrid Clusters for Internal/External Projects at MAXST (https://maxst.com/ENG/main)

Roles: DevOps Engineer ~ Hybrid Clusters + CI/CD + Chatbot + Data Pipelines [contrib 50%]

- Hybrid Clusters Public Cloud, On-Premise Kubernetes, Multi-Cluster, API Gateway, IaC, GPU Operator
- CI/CD Public CI Platform, On-Premise Custom CI, GitOps CD, ChatOps for Results/Issues
- Pipelines Data Pipelines for ML Research, Production Pipelines for ML Inference

# Results: Hybrid Cluster Initiation ~ Increased On-Premise Resource Utilization + Reduced Public Resource Costs + DevOps Culture Propagation

- Cost Reduction Maintained public availability while reducing costs by 50% compared to pure cloud infrastructure using on-premises cost-effectiveness.
- Resource Utilization Utilized 90% of idle on-premises resources, provided multi-cluster for prototyping in other departments
- DevOps Culture Introduced cloud-native development environment. Propagated DevOps culture including app modernization and CI/CD. Decision support through monitoring.

# Skills: Skill Stack for DevOps and Hybrid Cluster

Kubernetes AWS EKS IaC Ansible Terraform CI/CD Bitbucket Pipeline Runners Argo CD Argo Workflows Python/FastAPI Python/Bolt (Slack)

#### Computer Vision Engineer at MAXST (https://maxst.com/ENG/main)

#### Roles: Associate Researcher ~ Algorithm research for digital twin systems and prototyping [contrib 50%]

- Digital Twins Digital twin system implementation using algorithms for converting perspective and 360 images to 3D space.
- AR/XR Camera calibration and AR/XR prototype development for various smart glasses
- Automation Development of automated pipelines for data acquisition and analysis
- Military Service Engaged in position related to graduate school majors and performed alternative military service.

# Results: Development of computer vision algorithms and construction of digital twin systems

- Digital Twins Research and development of Visual-SLAM and ICP algorithms for digital twin systems
- Automation Development of automated pipelines for data acquisition and analysis

# Skills: Skill Stack for computer vision research

Computer Vision Visual-SLAM SfM ICP Python OpenCV .NET/C# Unity

Jan 2012 - Aug 2020 (8 Years)

# Computer Vision and ADAS Researcher (Integrated Program) at POSTECH (https://eee.postech.ac.kr/)

### Roles: Graduate Student Researcher ~ Computer Vision and ADAS Research [full-time]

• 2018-2020 Computing and Control Engineering Lab. (Prof. SH, Han)

#### Digital Twins and Simultaneous Localization and Mapping (SLAM) Research

- Visual-SLAM Research using Multiple Cameras for Autonomous Driving
- Prototyping of Digital Twins for ADAS and SLAM
- Virtual Visual-SLAM for Real-World Environments
- 2012-2018 Advanced Signal Processing Lab. (Prod. H, Jeong)

#### Advanced Driver Assistance Systems (ADAS) and Edge Computer Vision Research

- High-Performance, Efficient FPGA Implementation of ADAS
- High-Speed Algorithm Development for Traffic Signs and Road Terrain Detection
- Research on Stereo Vision Algorithm for 3D Depth Estimation
- Stereo Vision-based Online Calibration for Vehicle Cameras
- Optimization Algorithm Research for Computer Vision using Cost Aggregation Table

# Results: Proejcts and Research Papers ~ Studying on Automotive Simulations in Virtual Environments and ADAS On-Edge.

- Digital Twins
   Virtual Visual-SLAM for Real-World Environments
- Edge ADAS
  Research of ADAS including Traffic Sign Detection & Lane Terrain Detection with FPGA

# Skills: Skill Stack for Computer Vision and ADAS Research

 Computer Vision
 Digital Signal Processing
 Automotives
 Autonomous Driving
 Advanced Driver Assistance Systems (ADAS)

 Finite Programmable Gate Array (FPGA)
 Traffic Sign Detection
 Lane Terrain Detection
 MATLAB/Simulink
 C/C++

Education

Mar 2012 - Aug 2020

Python NET/C# C/C++ MATLAB

Master's Degree (Integrated Program) in Department of Electrical Engineering, Signal Processing & Computer Vision from Pohang University of Science and Technology (POSTECH) with GPA of 3.2/4.3

- Thesis: Virtual Visual-SLAM for Real-World Environments, 2020

Mar 2008 - Feb 2012

₱ Bachelor's Degree in School of Electronic Engineering, Electronic Communication from Kumoh National Institute of Technology (kit) with GPA of 4.3/4.5

- Thesis: A Study on a Visible Light Communication using LED in Under-water Environment, 2011

Awards

May 2014

Altera Design Contest 2014, Excellence Prize from Intel-Altera Korea

[System] FPGA, Vision-Based Driver Support Navigation System

May 2014

Best Poster Session in Workshop from KYUTECH-POSTECH Joint Workshop

[Poster] Iterative Polygon Detection using Harris Corner Space Method for Finding Traffic Signs

May 2013

Altera Design Contest 2013, 2nd Prize from Intel-Altera Korea

[System] FPGA, Vision-Based Traffic Sign Recognition System

Feb 2012

🏅 Highest Honors in Undergraduate School from Kumoh National Institute of Technology

[Summa Cum Laude] Highest Honors in Undergraduate Electronic Engineering School

Jan 2012

NAVER Power KiN 2011 (https://m.site.naver.com/1y6qP) from NAVER

[Activity] Knowledge Export in `Electronics Engineering, Mathematics and Programming fields`. Active 2009-2011, Selected as a MVP in 2012 / Total number of answers 723, Selection ratio 98.1%

Jul 2020, POSTECH, Thesis (1st)

🕏 Virtual Visual-SLAM for Real-World Environments (http://postech.dcollection.net/common/org/iew/200000341295) by <u>Jeayoung Jeon</u>

Nov 2014, ISVC, Advances in Visual Computing, 10th International Symposium (2nd)

Cost Aggregation Table: Cost Aggregation Method Using Summed Area Table Scheme for Dense Stereo Correspondence
(https://doi.org/10.1007/978-3-319-14249-4\_78) by JeongMok Ha, <u>Jeayoung Jeon</u>, GiYeong Bae, SungYong Jo & Hong Jeong

Oct 2014, ICCAS, 14th International Conference on Control, Automation and Systems (1st)

Polygonal symmetry transform for detecting rectangular traffic signs (https://doi.org/10.1109/ICCAS.2014.6987934) by <u>Jea Young Jeon</u>, JeongMok Ha, Sung Yong Jo, Gi Yeong Bae, Hong Jeong

Apr 2011, ICS-KIEE (1st, equivalent)

Raspberry Pies | Personal RAG | Live Demo

Languages

Korean:

English:

A Study on a Visible Light Communication using LED in Under-water Environment (https://www.dbpia.co.kr/Journal/articleDetail?nodeld=NODE01951197) by Daehee Lee, Ki-Sung Park, <u>Jea-Young Jeon</u>, Yeon-Mo Yang

# Certifications Nov 2024 (Expired in Nov 2027) GitHub Foundations (https://www.credly.com/badges/876fa6b3-0b27-44dd-bbb3-a9d85391856e) from GitHub Sep 2024 (Expired in Sep 2026) CAPA: Certified Argo Project Associate (https://www.credly.com/badges/ee42c2c7-2ac3-411f-8713-ce26cbbc8022) from The Linux Foundation Jun 2024 (Expired in Jun 2026) CKAD: Certified Kubernetes Application Developer (https://www.credly.com/badges/9e072a3a-57d0-403e-8bet-8831d618675c) from The Linux Foundation Mar 2024 (Expired in Mar 2027) CKA: Certified Kubernetes Administrator (https://www.credly.com/badges/d944bde7-222a-4ce5-b4e6-4e6c84df0efs) from The Linux Foundation Interests DevOps Culture: Coop First, Tech Next | Automate as Possible | Internal Development Platform Cost Efficiency: AMD-to-ARM Transition | Hybrid Clusters

Native

Working Proficiency