

# Koyilbek Valiev



E-mail: [valievkoyiljon112@gmail.com](mailto:valievkoyiljon112@gmail.com)



Phone: +(82)-010-2253-3010



GitHub: [github.com/koyilbek](https://github.com/koyilbek)



Website: [valiev-koyiljon.github.io/Web](https://valiev-koyiljon.github.io/Web)

## Summary

---

AI Engineer with 2+ years of hands-on experience building vision-language systems and machine learning pipelines. Proven track record in video anomaly detection, time series forecasting, and multimodal retrieval using VLMs. Actively exploring VLM/LLM-based methods, retrieval-augmented generation, and Vision-Language-Action (VLA) models, with a growing interest in real-world robotics applications.

## Experiences

---

### Multimodal AI Engineer Intern

*Pia Space, Seoul, South Korea*

*March 2025 - mid June 2025*

- **AI Video Anomaly Detection** : Collected and annotated diverse anomaly video datasets (e.g., violence, falls) using proprietary annotation tool. Optimized lightweight VLMs (<1B params) for video anomaly classification with dynamic sampling and prompt engineering in few-/zero-shot settings. Conducted both qualitative and quantitative analysis to evaluate and refine model performance.
- **Multimodal Retrieval for Video Anomaly Detection**: Co-developed MACS 3.0, a prompt-driven multimodal system for CCTV anomaly detection, achieving an overall model performance improvement of approximately 24% over previous versions. Built a benchmark dataset with manually captioned videos for video-text and video-video retrieval. Implemented and evaluated cross-modal retrieval models (video-to-text, text-to-video, video-to-video) to enhance scalable multimodal video understanding. Adapted a research method on multimodal explanation maps for vision-language models, generating visualizations that highlight key text prompt words and corresponding video regions to improve model interpretability and alignment.
- CTO-issued recommendation letter available: [View Letter](#)

### AI Engineer | Lead Intern

*Recs Innovation Ltd, Naju, South Korea*

*Feb 2024 – March 2025*

- **Bidding Amount Prediction**: Developed a dynamic ML pipeline that analyzes incoming data distributions and selects the best-performing algorithm. Implemented data cleaning, anomaly detection, feature engineering, and clustering, achieving a 0.0017% prediction error and a 15× increase in bid win rate.
- **Solar Power Forecasting**: Built a 48-hour ahead forecasting system based on a hybrid neural network combining CNN, LSTM, GRU, and Transformer layers to capture spatial, temporal, and long-range dependencies. Leveraged forecasted weather data to reach an average 6% prediction error. The solution was integrated and deployed on the Sun-Q EMS platform for real-time energy optimization.
- **Photovoltaic Sensor Anomaly Detection**: Led development of an unsupervised AI solution using sensor data from solar plants. Employed models including LSTM Autoencoder, LSTM-VAE, TranAD, and VAE to detect anomalies, achieving over 70% F1-score on real-world data. The solution is deployed in the Sun-Q EMS platform for continuous monitoring and fault detection.
- **Documentation & Team Leadership**: Authored comprehensive technical documentation on system architecture and data workflows. Managed a small AI team using Notion and ClickUp for project planning, task delegation, and progress tracking, enhancing team efficiency and delivery.

## AI Research Intern

Capstone Project, Woosong University

Sep 2023 - Dec 2023

- Coordinated team of 4 engineers to develop a real-time trash-bag optimization system for NetVision.
- Developed YOLOv8 to detect, classify, segment, track & size-estimate bags in video.
- Participated with this project in Woosong University's 2023 Capstone Competition with permission from NetVision, winning 1st place award.

## AI Intern

Sequus PTY LTD, Australia (Remote)

Jun 2023 - Aug 2023.

- Automated conversion of bounding-box outputs into YOLO, Pascal VOC, and custom formats.
- Annotated hundreds of architectural drawings (Labellmg) to improve model accuracy.

**Projects:** [Refer portfolio koyilbek for more details and other projects](#)

---

- **Multimodal Video Search and Interaction with RAG:** Developed a retrieval-augmented video QA system using Whisper, LLaVA, BridgeTower, LanceDB, LangChain, and Gradio. Integrated multimodal retrieval to enable natural language interaction with video content. More details in: [View Project](#)
- **Neural Conversational Chatbot:** Designed and implemented a Seq2Seq chatbot in PyTorch using a bidirectional GRU encoder and GRU decoder with Luong's global attention. Trained on 220K+ Cornell Movie Dialogs; optimized with 2 layers, 500 hidden units, and dropout. Included attention visualization and modularized code for scalability. More details: [View Project](#)

## Education

---

### Woosong University

Bachelor's in AI & Big Data | 2021 – 2025

**Key courses:** Data Visualization, Artificial Intelligence, Machine Learning Theory & Lab, Computer Vision, Statistics, Linear Algebra, Discrete Mathematics, Capstone Project

## Skills

---

Python, PyTorch, Hugging Face Transformers, LangChain, LlamaIndex, FastAPI, OpenCV, Ollama, Unsloth, MLflow, Optuna, Git, NumPy, Pandas, Scikit-learn, Matplotlib, Docker, Gradio, Public Speaking, Team Player

## Awards

---

- **1st Place**, Woosong University Capstone Competition among 200 teams (Dec 2023)
- **President's Award**, Woosong University (Dec 2023)
- **100% Merit Scholarship**, Woosong University (Sep 2023 – Dec 2023)
- **1st Place**, IoT Learning Concert (Sep 2023 – Dec 2023)
- **2nd Place**, Machine Learning Lab Learning Concert (Sep 2023 – Dec 2023)