Koyilbek Valiev

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Summary

Hello! I'm Koyilbek from Uzbekistan, a passionate AI engineer dedicated to building intelligent systems and leveraging cutting-edge technologies to solve real-world problems. With over two years of experience in diverse, hands-on projects, I bring a proven ability to tackle challenges and drive impactful solutions. I am deeply committed to continuous learning and growth, currently expanding my expertise in Natural Language Processing and Reinforcement Learning. I thrive on creating innovative solutions that contribute to societal progress. For more insights into my work and skills, feel free to interact with my chatbot.

Experiences

AI Engineer *Recs Innovation Ltd, Naju, South Korea*
July 2024 – Present

Optimal Bidding Prediction:

- Engineered an ML-based bidding optimization system for energy projects integrating supervised learning and time series analysis:
  - Built comprehensive data pipeline with automated cleaning, anomaly detection, and feature engineering.
  - Achieved 0.7 % prediction error rate through ML algorithms and neural networks.
- Increased bid winning probability by 15x (system currently in testing phase).

Solar Power Generation Prediction Project:

- Developed an end-to-end solar power forecasting system achieving 6-8% forecast error rate through hyper parameter tuning and weather forecast data integration.
- Designed and implemented a comprehensive prediction framework utilizing:
  - Advanced neural networks: Custom LSTM-CNN hybrid architecture, GRU with attention mechanisms, and transformer-based models.
  - Classical ML models: Optimized implementations of Linear Regression, XGBoost, and Random Forest algorithms.
  - Reinforcement learning: Developed custom OpenAI Gym environments to implement reinforcement learning algorithms (PPO, A2C, DDPG) with PyTorch and Stable-Baselines3 for power prediction.
- Successfully integrated the optimized prediction model into Sun-Q Energy Management System (EMS), enabling real-time power generation forecasting capabilities.

AI Team Lead *Recs Innovation Ltd, Naju, South Korea*
March 2024 – July 2024 (5 months)

- Led development of an advanced unsupervised anomaly detection system for photovoltaic sensors, successfully integrated into Sun-Q Energy Management System (EMS).
- Implemented state-of-the-art deep learning architectures (LSTM Autoencoder, LSTM-VAE, TranAD) while overseeing team development of GNN and USAD models.
- Built automated data pipeline processing 1.3M+ daily sensor readings, reducing preprocessing time from 3 hours to 15 minutes.
- Established MLflow experimentation framework for systematic model evaluation and optimization, tracking key performance metrics (recall, precision, F1-score) across multiple architectures.

- Managed comprehensive technical documentation efforts, creating detailed guides for model architecture, data workflows, and deployment procedures.
- Led small AI team using Notion/ClickUp, maintaining regular communication about project updates with executives, and coordinating international stakeholder meetings with Uzbek Energy.
- Orchestrated end-to-end development of deep learning solutions while ensuring quality standards and meeting project deadlines.

AI Intern *Recs Innovation Ltd, Naju, South Korea*
Feb 2024 – March 2024 (one month)

- Collaborated with CTO and Department Head to analyze photovoltaic plant anomaly detection requirements, maintaining detailed project documentation in Notion.
- Developed and implemented standard Autoencoder and Variational Autoencoder models for solar panel sensor data, achieving 65% F1-score on synthetic test data.

AI Research Intern *Capstone Project, Woosong University*
Sep 2023 - Dec 2023 (4 months)

Developed AI-Powered Trash Bag Optimization System:

- Coordinated team of 4 engineers to create computer vision system for NetVision optimizing trash bag collection routes and processes.
- Utilized YOLOv8 architecture to AI system detecting, classifying, segmenting, tracking, and size-estimating trash bags from video in real-time.
- Participated with this project in Woosong University's 2023 Capstone Competition with permission from NetVision, winning 1st place award.

AI Research & Computer Vision Intern *Sequus PTY LTD, Australia (Remote)*
Jun 2023 - Aug 2023 (2 months)

Utilized advanced image annotation techniques to enhance the accuracy of architectural models:

- Annotated hundreds of architecture drawings and labeled key components like one and multiple regions on constructional floor plans using LabelImg.
- Wrote scripts to transform output bounding boxes from model to various formats including YOLO, Pascal VOC.

Computer Vision & IoT Intern *The Sparks Foundation, India (Remote)*
May 2023 - June 2023 (one month)

Architected Real-Time Face Mask Detection System:

- Developed end-to-end deep learning pipeline using PyTorch, OpenCV, and MTCNN enabling 97% accurate identification of mask wearing from live video.
- Fine-tuned ResNet50 pre-trained model through transfer learning, retraining final layers to categorize mask wearing from real-time feed.
- Mastered data preprocessing and model training.

Projects: Refer portfolio koyilbek for more details and other projects

- ***Neural Conversational Chatbot with Attention Mechanisms:*** Engineered an advanced conversational AI system implementing sequence-to-sequence architecture with attention mechanisms using PyTorch and Python. Developed a sophisticated chatbot utilizing bidirectional GRU encoder-decoder architecture with Luong's global attention mechanism for enhanced natural language understanding. I strategically implemented deep learning techniques including dropout regularization (0.1) and adaptive learning rates (0.0001) while training on the Cornell Movie-Dialogs Corpus containing 220K+ conversations. The project leveraged state-of-the-art attention mechanisms from key research papers, achieving conversational capabilities through a modular codebase architecture. More details in***: Project Link***

- **LLaMA Customer Support Assistant***:* Built an advanced customer service AI system by fine-tuning LLaMA 3.2 model with Unsloth optimization, implementing LoRA fine-tuning for 2x faster training speed while maintaining efficiency on M1 architecture. Engineered custom data processing pipeline for 27K customer support conversations, optimizing memory usage through gradient checkpointing and efficient batching. Achieved natural language response generation for order-related queries while keeping memory usage under 8GB RAM. Developed comprehensive testing suite and performance visualization tools using PyTorch, Transformers, Python 3.10, and Apple M1 MPS backend. More details in: *Project Link*

Education

Woosong University *Sep 2021 - June 2025*
Bachelors, Major in AI & Big Data

Fergana High School No: 13 *Sep 2020 - June 2021*
*GPA:5/5, Achieved 4A*s in Physics and Mathematics*

Skills

Technical Skills: Python, PyTorch, TensorFlow, Git, GitHub, Hugging Face, Transformers, FastAPI, Docker, MLflow, Optuna, Ollama, LLaMA, Unsloth, PEFT, Accelerate, NLTK, Stable-Baselines3, OpenAI Gym, and other data science libraries .

Soft: Project Management, Problem-Solving, Critical Thinking, Leadership, Public Speaking, Adaptability, Team Player.

Awards

Merit-Based 100% Scholarship Award	Woosong University, Sep 2023 - Dec 2023
Woosong University President's Award	Woosong University, Dec 2023
IoT Class Learning Concert Winner	Woosong University, Dec 2023
2nd place in ML Class Concert Competition	Woosong University, Dec 2023
2nd Place in District English Language Competition	Fergana District Olympiad, 2019
1st Position in Inter-School Olympiad	Fergana District Olympiad, 2015
Top Performer in Chess Competition	Fergana Chess Competition, 2013

Other Experiences

- *Volunteer Experience (Jul 2023 - Nov 2023):* Served as a Sol-Green Police Volunteer at Woosong University, leading campus environmental initiatives to maintain cleanliness and promote sustainability.
- *Teaching Experience (Oct 2021- Dec 2021):* Taught a foundational Python programming course to freshmen at Woosong University, delivering lectures and hands-on tutorials via Zoom.
- *Book Translation Project (2021):* Led a team to translate and publish three books, managing copyright acquisition, translation processes, and final publication, successfully expanding access to literature in Uzbek language.