

BETHEL MELESSE TESSEMA

melessebethel@gmail.com [Github](#) [LinkedIn](#) +82-10-9734-3705 DOB: 1996-09-11 (Female) Seoul, South Korea

Visa: Korea F-2-7 (No Sponsorship Required) | Open to Relocation

AI/ML Engineer with a Master's degree in AI and 3+ years of experience spanning research and industry. Specialized in deep learning for NLP, Computer Vision, and Computational Drug Discovery, with extensive experience in data processing and model evaluation. Developed and optimized end-to-end pipelines across diverse applications, including multimodal systems, multilingual and low-resource language adaptation, and bioinformatics for structure-based drug design.

EDUCATION

M.S. in Artificial Intelligence (2022 – 2024), CGPA: 4.31/4.5 Ajou University, Suwon, S.Korea

B.A in International Studies (2018 – 2022), CGPA: 3.75/4.5 Hankuk University of Foreign Studies, Seoul, S.Korea

Software Engineering (2015 – 2017), 3 semesters Addis Ababa Institute of Technology, A.A, Ethiopia

WORK EXPERIENCE

AI Engineer, AI Team, 3Billion, Seoul, S. Korea 2024 – Present

- **Forward Synthesis Evaluation Model:** Developed a neural network model to score synthetic feasibility of reaction pathways in an RL-based molecular generation pipeline. Optimized training workflows using PyTorch, RDKit, and DeepChem, achieving 24× speedup (days → 1 hour). Benchmarked performance via AUROC, AUPRC, and Tanimoto similarity in collaboration with experimental chemists to ensure real-world validity.
- **End-to-End Protein-Ligand Interaction Prediction Model:** Developed an E2E model to predict binding pockets, ligand poses, and binding affinities for structure-based drug discovery. Led data preprocessing and graph construction from raw structural formats (PDB, MOL2, SDF) using RDKit, DeepChem, and TorchDrug. Designed and trained multi-task GNN architectures with attention mechanisms. Implemented distributed training across multiple GPUs and established reproducible ML workflows with MLflow for experiment tracking, model versioning, and hyperparameter tuning.

AI Researcher, DBDC Lab, Ajou University, Suwon, S. Korea 2022 – 2024

- **Information Retrieval for Low-Resource Languages:** Trained a BERT-like transformer language model for information retrieval in African languages. Compared traditional methods (TF-IDF, BM25) with state-of-the-art approaches.
- **Generalized Output Spaces for Classifiers:** Improved cross-domain and cross-task generalization in multi-modal classifiers by fusing descriptions of classes/tasks. Achieved state-of-the-art zero-shot performance on CIFAR, RCV1, and 20NG.
- **Extracting Low-Resource Datasets for LLM Adaptation:** Processed >1000 TB of Common Crawl data for under \$2, creating monolingual datasets for 7 low-resource languages. Fine-tuned multilingual LLMs using Quantized Low-Rank Adaptation (QLoRA) on consumer GPUs. Published in the [Proceedings of the Korean Institute of Communications and Information Sciences](#).
- **Publications:** UnifiedCrawl: Aggregated Common Crawl for Affordable Adaptation of LLMs on Low-Resource Languages — ([Preprint](#)) ([GitHub](#))

PERSONAL PROJECTS

Model Implementation from Scratch: Implemented foundational deep learning models using PyTorch and NumPy to understand their internal workings across multiple domains: Natural Language Processing; and Computer Vision; Graph Neural Networks.

TECHNICAL SKILLS

- **Programming Languages:** Python, Java, Bash/Shell Script
- **Deep Learning Frameworks:** PyTorch, TensorFlow, HuggingFace Transformers
- **DevOps Tools & Version Control:** Docker/Conda/Venv, Git/GitHub, Linux (Ubuntu)

CERTIFICATES, AWARDS & SCHOLARSHIPS

- **Academic Scholarship:** Ajou Research(2023) - Recommended by HOD as Excellent Student, BK Research (2022-2024), Ajou Tuition (2022-2024), HUFS Tuition (2017-2022), Exemplary Student Award (2017)
- **Korean War Scholarship:** Embassy of ROK (2016), Korean War Memorial Foundation (2017-2022), Korean War and Military, Police Widow's Association (2020), Memorial Association of UN Participation in Korean War (UNPK) (2023)
- **Certificates:** KAIST-AAiT IT Training Course (2016), Intensive Korean Language Course, HUFS (2017-2018)

HOBBIES, VOLUNTEERING & INTERESTS

Volunteering for NGOs (Korean Saemul Undong Center, The Korea-Africa Foundation Festival, etc.), Part-time as Translator/Interpreter at the Korean War Veterans Revisit Program (2018-2025), Barista at Hwacheon Ice Festival