DUNCAN KIBET

PhD Candidate in Industrial Engineering | AI Researcher | Computer Vision & Applied Machine Learning
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PROFILE

AI researcher with 6+ years of experience turning machine learning research into working systems for healthcare, energy, manufacturing, and safety. Research focus on Transformer-based 3D human pose estimation and computer vision. **Expected PhD graduation: February 25, 2027.**

EDUCATION

Ph.D., Industrial Engineering, Chosun University 2022 – Feb 2027
Gwangju, South Korea · GPA 4.08 / 4.5 · Advisor: Prof. Jong-Ho Shin

- **Expected graduation: February 25, 2027**

M.Eng., Industrial Engineering, Chosun University 2020 – 2022
Gwangju, South Korea · GPA 4.38 / 4.5

- **Thesis:** *Image Analysis based on AI Application for Manufacturing Automation* (YOLOv3 + Deep SORT counting under occlusion; ResNet-50 + Grad-CAM inspection)

B.Eng., Materials Science and Engineering, Chosun University 2015 – 2020
Gwangju, South Korea

JOURNAL PUBLICATIONS

- M. S. So, D. B. Kim, **D. Kibet**, J.-H. Shin. *Development of a Deep Learning-Based Decision Framework for Optimal Process Parameter Selection in Metal Additive Manufacturing*. **Sensors**, 26(4), 1124, 2026. doi:10.3390/s26041124
- **D. Kibet**, M. S. So, J.-H. Shin. *Minimalist Deep Learning for Solar Power Forecasting: Transformer-Based Prediction Using Key Meteorological Features*. **Energies**, 18(24), 6395, 2025. doi:10.3390/en18246395
- **D. Kibet**, M. S. So, H. Kang, Y. Han, J.-H. Shin. *Sudden Fall Detection of Human Body Using Transformer Model*. **Sensors**, 24(24), 8051, 2024. doi:10.3390/s24248051
- H. H. Kang, M. S. So, **D. Kibet**, J.-H. Shin. *Fall Detection Model Using LSTM Architecture: A Video Data-Based Approach*. **Journal of the Korean Society of Industrial and Systems Engineering**, 47(4), 110–119, 2024.
- **D. Kibet**, J.-H. Shin. *Counting Abalone with High Precision Using YOLOv3 and DeepSORT*. **Processes**, 11(8), 2351, 2023. doi:10.3390/pr11082351
- M. S. So, **D. Kibet**, T. K. Woo, S.-J. Kim, J.-H. Shin. *Prediction of SOx-NOx Emission in Coal-Fired Power Plant Using Deep Neural Network*. **Machines**, 11(12), 1042, 2023. doi:10.3390/machines11121042

CONFERENCE AND WORKSHOP PRESENTATIONS

- **D. Kibet**, M. So, H. Kang. *Transformer-Based Occlusion for 3D Human Pose Estimation: A Focus on Reconstruction of Invisible Keypoints*. **IEEE INDIN 2026**, Melbourne, Jul 2026; also **PHM Korea 2026**, Busan, Jun 2026.
- H.-Y. Park, S.-O. Lee, G.-Y. Park, H.-Y. Kang, **D. Kibet**, J.-H. Shin. *AI-Based Elbow Range-of-Motion Measurement and Classification Model*. CDE Summer Conference, Jeju, Aug 2026 (poster).
- *Advancing ATC Drug Classification Through Graph Convolutional Networks*. Singapore Scientific Conference, Dec 2025 (poster).
- **D. Kibet**, M.-S. So, H. Kang, J.-H. Shin. *Graph Convolutional Networks for ATC Drug Classification from Molecular Data*. **PharML Workshop, ECML PKDD 2025**, Porto, Sep 2025.
- **D. Kibet**, M.-S. So, H. Kang, J.-H. Shin. *Enhanced Time Series-Based Solar Power Prediction Using Minimal Feature Selection*. **TempXAI Workshop, ECML PKDD 2025**, Porto, Sep 2025.
- H. H. Kang, M. S. So, **D. Kibet**, J.-H. Shin. *Research on Fall Detection Using Transformer Model Based on Video Data*. KIIE Spring Joint Conference, Jeju, Jun 2025.
- **D. Kibet**, J.-H. Shin. *Machine Learning-Based Anomaly Detection in Optical Lenses*. Korean Reliability Society Spring Conference, Jeju, Jun 2025.
- H. H. Kang, M. S. So, **D. Kibet**, J.-H. Shin. *AI Model Development for Smart Operation on Additive Manufacturing to Improve Surface Roughness*. 2025.
- *Development of AI-Based Fall Detection Model Using Transformers*. CDE Winter Conference, Pyeongchang, Jan 2024.

RESEARCH AND INDUSTRY PROJECTS

Power Plant SOx/NOx Emission Prediction · National Research Foundation of Korea 2020 – 2023

- Predicted NOx/SOx emissions from coal-fired plant data with deep neural networks, Random Forest, and XGBoost; contributed to a 15% emission reduction through smarter controls. Published in Machines (2023).

Solar Power Plant Fault Prediction and AI Valuation · Ilju G&S 2023 – 2024

- Built XGBoost and LSTM models for PV fault prediction and asset valuation; improved fault detection by 30%, reducing maintenance overhead.

Solar Power Forecasting with Transformers · Ilju G&S 2022

- Developed a Transformer forecasting model that reduced error by 12% compared with LSTM baselines.

AI-Based Road Safety Incident Detection · Korea Transport Institute 2022

- Designed a YOLOv5 detection system for CCTV traffic-incident monitoring, deployed in pilot environments to shorten emergency response.

Fall Detection from Pose Keypoints 2024 – 2025

- Transformer models on OpenPose/MediaPipe keypoints for real-time fall detection, reaching 92% accuracy with few false positives. Published in Sensors (2024) and basis of a patent application.

Air Quality Forecasting · Chosun University LINC+ 2021

- LSTM and CNN models for indoor fine-dust prediction from real-time sensor data, reaching 87% accuracy.

Lens Image Inspection and PV Anomaly Detection · IOSOLUTION Gwangju 2020

- ResNet-50 + Grad-CAM classifier for normal/abnormal lens images (97% accuracy); hybrid XGBoost, AE-LSTM, and Isolation Forest models for solar panel fault detection.

PATENTS (KOREA, FILED, PENDING EXAMINATION)

- **Predictive Model-Based Classification of ATC Codes** · No. 10-2024-0148250 · filed Oct 28, 2024
- **Predictive Model-Based Fall Detection Using Key-Point Analysis** · No. 10-2024-0164731 · filed Nov 19, 2024

REGISTERED SOFTWARE (KOREA COPYRIGHT COMMISSION, 2025)

- **Real-Time Object Detection, Tracking, and Occlusion Recovery AI System** · C-2025-058118
- **Fuzzy Matching and OCR-Based Automated Document Classification System** · C-2025-058117
- **Standard Work Time Calculation System Based on Energy Usage** · C-2025-051768
- **Plant Image Batch Area Analysis and Growth Stage Classification Program** · C-2025-055315
- **Plant Area Analysis Results Storage and Reporting System** · C-2025-056042

TEACHING AND ACTIVITIES

- **Instruction, Chosun University (2020 – 2024):** Deep Learning and AI Fundamentals; Computer Vision and Image Processing; Machine Learning for Industrial Applications; Python for Data Science and AI. Supervised graduate and undergraduate research projects.
- **ICT Innovation Square developer team-building (2022 – 2024):** selected for 3 cohorts; built AI for UAM battery diagnosis, video emergency detection, and SMILES-based active-ingredient prediction.
- **RISE Startup Commercialization Bootcamp (2025);** BIXPO / GPVC technology workshop (2021).

TECHNICAL SKILLS

Languages: Python, Dart (Flutter), TypeScript, Java, Node.js, MATLAB, SQL

Machine learning: PyTorch, TensorFlow, Keras, scikit-learn, XGBoost, Hugging Face Transformers; OpenCV, YOLO, MediaPipe, OpenPose, Grad-CAM; GNNs, LSTMs, Prophet

Deployment and data: FastAPI, Flask, React, Docker, Kubernetes, AWS SageMaker, Google Cloud, Firebase, PostgreSQL, MySQL, Apache Spark, Git, GitHub Actions, Linux