WILLY FITRA HENDRIA

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Skills

- Machine Learning | Computer Vision | Vision-Language | Full-Stack | English, Indonesian
- Python | Java | C++ | C# | JavaScript | HTML | CSS | SQL | NoSQL | Git | Docker | GCP | Airflow | FastAPI
- PyTorch | TensorFlow | Scikit-learn | OpenCV | spaCy | Pandas | TorchServe | TensorFlow Serving

Experience

AI Research Engineer — **Dagyeom Co., Ltd.** — *South Korea* — **10/2023 - Present**

- Developing a **desktop** and **web** application for the real-time anomaly detection system of video and audio data.
- Researched and deployed a state-of-the-art **anomaly detection** model (from CVPR) into an existing system.
- Implemented **multithreading** with **ONNX** in C# and Python, resulting in a **20x improvement** in inference time.
- Authored a research paper on unsupervised anomaly detection for publication in an **SCI-level** journal.
- Proposed and developed a novel approach for **unsupervised anomaly detection** using **PyTorch**.

AI Research Engineer — **Tricubics** — *South Korea* — **04/2023 - 10/2023**

- Implemented **multi-GPU inference** with **multithreading**, resulting in an 80% improvement in the FPS of multi-model ML system.
- Built and deployed an **object detection** model for real-time video stream data, achieving a 35% gain in mAP.
- Built and deployed a state-of-the-art **pose estimation** model (published in 2023), resulting in 26% AP gain.
- Built and deployed an **image classification** model, resulting in 33% improvement in the F1 score.
- Improved a knowledge-based **action recognition** algorithm by integrating **object tracking** and **sensor fusion** techniques, resulting in a considerable 24% enhancement in accuracy.

Graduate AI Researcher — **VLI Lab (Sejong University)** — *South Korea* — **03/2021 - 03/2023**

- Produced the highest research output in the lab by writing two first-authored papers, filing two patents, and leading teams in completing **deep learning**-based projects, such as **object detection** and **video captioning**.
- Proposed and developed a novel **graph neural network**-based **video captioning** using **PyTorch**, which achieved state-of-the-art results.
- Reproduced several **machine learning** papers, such as **federated learning**, **object detection**, **video captioning**, and **video retrieval**.

Machine Learning Engineer — **Detik Network** — *Indonesia* — **11/2019 - 10/2020**

- Built **Scikit-learn**-based **classification**, **regression**, and **clustering** models for AI use cases in online media articles, such as **tagging** and **categorization** of articles, **recommendation engine,** and **customer segmentation**.
- Improved preprocessing time of 20 million data from 50 minutes to 3 minutes by converting the **Spark**-based code to **Google BigQuery**.
- Built monitoring and inference pipeline of **Google AutoML** model for batch prediction by using **Apache Airflow**.

Software Engineer — **Works Applications Co., Ltd.** — *Singapore, Japan* — **01/2016 - 09/2018**

- Led the development of the UI component library from understanding the requirements, implementation, code reviewing, and testing.
- Improved build time of a large project from more than 1 hour to less than 20 minutes.
- Designed and developed the **front-end** and **back-end** of an e-commerce system using **Java Spring** framework.

Education

Master of Science — **Sejong University** — *South Korea* **03/2021 - 02/2023**

- Major in Intelligent Mechatronics Engineering and Convergence Engineering for Intelligent Drone (Dual Degree). **Thesis:** Video Captioning Based on Graph Neural Networks Using Action Knowledge

Nanodegree — **Udacity** — *Online* **11/2019 - 02/2020**

- Program in Machine Learning Engineer. **Capstone Project:** Cat Breed Image Classification Using CNN [link]

Bachelor of Science — **Bandung Institute of Technology** — *Indonesia* **08/2011 - 09/2015**

- Major in Computer Science (Informatics). **Relevant Courses:** Artificial Intelligence, Machine Learning, Database, and Software Engineering

Projects

- **MSVD-Indonesian:** A benchmark for multimodal video-text tasks in Indonesian [link] (**2023**)
- **Graph Transformer**: An unofficial implementation of Graph Transformer in PyTorch [link] (**2023**)
- **CLIP4Caption**: An unofficial implementation of CLIP4Caption in PyTorch [link] (**2022**)
- **Federated Learning**: An unofficial implementation of federated learning in TensorFlow [link] (**2021**)

Publications

- Action knowledge for video captioning with graph neural networks, JKSU-CIS (**Q1**), Elsevier [link] (**2023**)
- Improving distinctiveness in video captioning with text-video similarity, Image and Vision Computing (**Q2**), Elsevier [link] (**2023**)
- Non-contact supervision of COVID-19 breathing behaviour with FMCW radar and stacked ensemble learning model in real-time, Transactions on Biomedical Circuits and Systems (**Q1**), IEEE [link] (**2022**)
- Non-Contact Monitoring and Classification of Breathing Pattern for the Supervision of People Infected by COVID-19, Sensors (**Q1**), MDPI [link] (**2021**)
- Combining transformer and CNN for object detection in UAV imagery, ICT Express (**Q1**), Elsevier [link] (**2021**)

Patents

- Knowledge distillation for graph-based video captioning, KR, Unexamined, App. No. 1020220018494 [link] (**2022**)
- Transfer of tactile data in teleoperation system, KR, Granted, App. No. 1020210154046 [link] (**2021**)

Peer-reviews

- **Reviewer**: Signal Processing Letters (**Q1**), IEEE (**2023**)
- **Reviewer**: Complex & Intelligent Systems (**Q2**), Springer (**2023**)
- **Reviewer**: Transactions on Intelligent Transportation Systems (**Q1**), IEEE (**2022**)
- **Reviewer**: Artificial Intelligence Review (**Q1**), Springer (**2022**)

Others

- Contributed to several open-source projects, including **Anomalib**, **MMPose**, and **SEACrowd** **(2023 - 2024)**
- Served as the Sejong University **representative** for the Indonesian Students Association in Korea (**2021 - 2023**)
- Spoke as an **invited speaker** on “Object Detection for Drone Imagery” in the digiXed Webinar (**03/2023**)
- Instructed Big Data Analytics for Indonesian government staff in a five-day online training organized by the Ministry of Communication and Information Technology (**03/2023**)
- Awarded the **AWS Scholarship,** securing a position among the top 300 performers in the Amazon Web Services DeepRacer Challenge (**11/2019**)
- Achieved a **Gold Medal** in an intra-university chess team competition at Olympiad VIII KM-ITB 2015 (**02/2015**)