Alif Wicaksana Ramadhan

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Education

Politeknik Elektronika Negeri Surabaya — *Surabaya*
Bachelor in Electronics Engineering — 2016 - 2020

Politeknik Elektronika Negeri Surabaya — *Surabaya*
Master in Electrical Engineering — 2021 - 2023

Experiences

Intelligent Robot System Laboratory (IRoS) - University of Indonesia — *Depok*
Professor Assistant — Feb. 2024 - Now

PT.Fiesto — *Surabaya*
Software Developer (Fulltime) — Aug. 2023 - Jan. 2024

PT.Santai Berkualitas Syberindo — *Bandung (Remote)*
Software Developer (Fulltime) — Sep. 2022 - Mar. 2023

PT.Santai Berkualitas Syberindo — *Bandung (Remote)*
Software Developer (Freelance) — May. 2022 - Aug. 2022

Self Freelance — *Surabaya*
Machine Learning Developer — Nov. 2020 - Jan. 2022

Technical Skills

Programming	C, C++, Python, Javascript
Professional Softwares	Linux, Robot Operating System (ROS/ROS2), PyTorch, Tensorflow, OpenCV, Flask, FastAPI, Git, Docker, CI/CD
Hardware	STM32, ESP32, AVR, Arduino, PCB Design (Eagle)
Languages	Indonesian, English (IELTS 6.5), Japanese (Never took the real JLPT, but I passed N4 on a simulation test.)

Publications

[1] **Alif Wicaksana Ramadhan**, Bima Sena Bayu Dewantara, Setiawardhana. "Lidar-based Human Detection for a Mobile Robot in Social Environment using Deep Learning," *International Electronics Symposium (2023)*, pp. 268-274, 2023. [Link]

[2] **Alif Wicaksana Ramadhan**, Fira Aulia, Idris Winarno, Sritrusta Sukaridhoto, Ni Made Lintang Asvini Dewi. "Image Stitching Process on Multi-Camera Stream System using MPI," *International Journal on Informatics Visualization (JOIV)*, vol. 8, no. 1, 2024. [Link]

[3] **Alif Wicaksana Ramadhan**, Bima Sena Bayu Dewantara, Setiawardhana. "Optimization of Fuzzy Social Force Model Adaptive Parameter using Genetic Algorithm for Mobile Robot Navigation Control," *Jurnal Rekayasa Elektrika*, vol. 19, no. 1, pp. 31-37, 2023. [Link]

[4] **Alif Wicaksana Ramadhan**, Ardik Wijayanto, Hary Oktavianto. "Implementation of Audio Event Recognition for The Elderly Home Support Using Convolutional Neural Networks," *International Electronics Symposium (2020)*, pp. 91-95, 2020. [Link]

Volunteer Services

IRoS Laboratory — *Depok*
Lecturer Assistant of Embedded Systems - Faculty of Computer Science — Aug. 2024 - Now

- Design a practical materials for a semester about AtmelXmega, Arduino, and ESP32.
- Create AtmelXmega, Arduino, and ESP32 Learning Module.
- Giving Lecture about AtmelXmega, Arduino, and ESP32.

IRoS Laboratory *Depok*

Lecturer Assistant of Robotics - Faculty of Computer Science Feb. 2024 - Jul. 2024

- Design a practical materials for a semester about ROS2.
- Create ROS2 Learning Module.
- Giving Lecture about Robot Kinematics, Linux, ROS2.

HIMA ELKA PENS *Surabaya*

Steering Committee - Java Robot Contest 9 Jul. 2017 - Apr. 2018

- Concept the design and the rules of the robotic contest.
- Manage members into several groups and several job-desk.

PENS UAV Fixed Wing research team *Surabaya*

Team Leader Sep. 2017 - Dec. 2018

- Manage team job-desk according the timeline of KRTI (Kontes Robot Terbang Indonesia).
- Manage team members into several job-desk.

Projects

Object Tracking using DeepSORT with Infrared Image Fusion *Depok*

Research Assistant on IRoS Laboratory Aug. 2024 - Now

- An object tracking for robust human tracking application. The system fused the rgb image data with infrared image data to gain more robust object detection within the various lighting conditions. A kalman filter used to estimate the next position of the tracked human, and estimate the current position of a human that not detected in current frame. A deep learning model for appearance feature extraction was utilized. These appearance feature then used to associate a list of human in the previous frame with the current frame.

Biometric Security System using Deep Learning *Depok*

Research Assistant on IRoS Laboratory Apr. 2024 - Jun. 2024

- A web application with bio-metric security applied. In this work, a user who login needs to capture their face. The face image is then fed into the Siamese network to classify whether the person is the same as the login data and whether the image is live or fake. The Siamese network used InceptionNet as the feature extraction layer to generate embedding. Before the bio-metric verification process, the user faces should registered. The registration was done by storing the embedding values in a vector database named QdrantDB. The face image was given to the feature extraction layer in the verification process, resulting in the embedding values. Then, the system searches for the nearest similarity with stored embedding within the database. If the resulting embedding is identical to the login data from the user, then the user is verified to log in.

Omni-wheel Mobile Robot Localization and Mapping using Ultra Wide-Band (UWB) *Depok*

Freelance Project Mar. 2024 - May. 2024

- An Omni-wheel mobile robot can create a map of gas leakage intensities. This robot utilizes three gas sensors and uses the sensor data with a neural network to classify the gas into three classes: butane, alcohol, and gasoline. The robot needs a precise localization system to create a stunning and accurate map. A trilateration-based localization was used since the robot's working area is in a warehouse, categorized as an indoor environment. The trilateration employed ultra-wide-band technology. There were four UWB devices. The first UWB is placed in the robot and works as a tag. The others were placed in a particular position and formed a triangle with certain distances.

Human Following Robot using Optimized Adaptive Social Force Model *Surabaya*

Master Student on PENS Jan. 2021 - Jul. 2023

- A differential drive mobile robot that capable to follows certain person by detect and track the position of the human legs position. Human legs were detected using a deep learning model, and tracked using kalman filter. Adaptive Social Force Model were utilized as the navigation control, which has been optimized using Genetic Algorithm. The optimization process was done in simulation using CoppeliaSim.

Leg detection using Lidar 2D *Toyohashi*

Student Exchange on TUT Oct. 2022 - Nov. 2022

- A tool for detect, track, and associate persons around a robot, to help the navigation processes of the robot. The scanned data from the lidar sensor were plotted into 2d map. from the 2d map, a SSD MobilenetV3 was utilized to detect the object that recognized as human legs.

Distributed Image stitching using MPI *Surabaya*

Master Student on PENS Aug. 2022 - Dec. 2022

- This is part of High Performance Computing course's tasks. The goal of this project is to improve the time process of image stitching by distribute the work loads to several nodes. In this work, to distribute the work loads, we implemented MPI.

Cheating detection system

Surabaya

Self Freelance

Jan. 2022 - Mar. 2022

- An application that provide cheating detection for monitoring the process of test. To recognize wether the person is cheating or not, the system used Yolov3 to detect the person's hands. We defined the working area of the person, if the detected hands went out from the defined frame, the system mark it as a cheating. MTCNN architecture also utilized to get facial feature to determine the person's gaze.

Mask detection on attendance system

Pasuruan

Self Freelance

Aug. 2021 - Oct. 2021

- An application that provide attendance system that also make sure if the attending person using mask due to covid19. This system utilize Local Binary Pattern Histogram (LBPH) for the face detection. To recognize the person identity, VGGNet16 was utilized. And for the mask detection, Yolov5 was utilized. MySQL was used as the database to record the user attendance data. All the system was implemented in a Raspberry Pi 4.

Event detection using Acoustic sensor

Surabaya

Self Freelance

Aug. 2020 - Oct. 2020

- A monitoring device that utilize microphone as the main sensor. The microphone is recording the sound around it, the do the feature extraction into the spectrogram form. In the spectrogram form, a Convolutional Neural Network were utilized to able recognize the recorded event. MySQL were used as the database to record the user attendance data, and laravel were used as the backend server. As the user interface, an android application was built.