Muhammad Azriel Rizqifadhiilah

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Education

Institut Teknologi Sepuluh Nopember **Aug 2022 – Aug 2023**
Master of Engineering in Control System Engineering (Honors) – (GPA:3.78/4.00) *Surabaya, Indonesia*

Institut Teknologi Sepuluh Nopember **Aug 2018 – Aug 2022**
Bachelor of Engineering in Electrical Engineering – (GPA:3.50/4.00) *Surabaya, Indonesia*

Skills & Interest

Languages: Python 10/10, Matlab 9/10, LaTeX 9/10, C++ 8/10, SQL 6/10.
Frameworks: Pandas, Numpy, Matplotlib, Tensorflow, Keras, OpenCV, YOLO, Robotics, Simulink, Deep Learning Toolbox, Control System Toolbox
Platforms: MATLAB, Visual Studio Code, Jupyter Notebook, Arduino, WeBots
Soft Skills: Leadership and Team Coordination, Mentorship and Teaching, Collaboration and Teamwork
Interests: Applied Artificial Intelligence in healthcare, Machine Learning, Deep Learning, Data Science, and Robotics

Experience

MATLABIA **May 2024 – Now**
Remote Part Time Programmer *Madura, Indonesia*

- Developed simulations for medical image analytics, the last project is to analyse medical data records X-rays to detect cancer using deep learning and image segmentation for MRI collaborated with Gajah Mada University.
- Developed deep learning models for medical image analysis to support disease diagnosis, leveraging advanced DNN.
- Analyzed diagnostic models using sensitivity and specificity to evaluate accuracy in true positive and negative.
- Designed and programmed artificial intelligence control systems for autonomous underwater vehicles, integrating advanced algorithms to enhance maritime capabilities, ensure precise movement, and maintain stability.

Center of Student Creativity Program ITS **Sept 2023 – Sept 2024**
Mentor *Surabaya, Indonesia*

- Guided and supported multiple teams in preparing and presenting scientific papers and innovative project ideas. Under my mentorship, teams achieved gold and silver medals in national competitions.
- Provided strategic advice and technical mentorship to teams developing various innovative concepts, ensuring the integration of cutting-edge technologies and methodologies.

ICHIRO Humanoid football Robots **Dec 2019 – Sept 2022**
Research and Development *Surabaya, Indonesia*

- Directed team efforts, achieved 1st place in humanoid Indonesian football robot contest for the third consecutive year (2019, 2021, 2022) and participated in International robotic competition RoboCup and FIRA.
- Developed algorithms and applied for obstacle detection that utilized computer vision methods that implemented the YOLOv3 algorithm to identify various objects .
- Holding basic robotics training for robotics enthusiast communities in university to national scope.

Systems and Cybernetics Laboratory **Sept 2020 – Sept 2022**
Coordinator Lab Assistance *Surabaya, Indonesia*

- Conducting basic MATLAB software training for students and workers in the scope of universities to national.
- Designed and implemented interactive GUI systems for smart modules in the digital control and automation laboratory.
- Helped students with their practicum on humanoid robots, 6-DOF robot manipulators, and 3D printing machines, and introduced a smart practice module system with simulations to enhance visualization and engagement.

Projects

Autonomous differential drive robot | *ITS Robotics Research Center* | Master Thesis **Aug 2022 – March 2023**

- Developed **point cloud data** from LiDAR sensor and **classified objects** for identifying and detecting office stuff based on shape and minimization noise by filtering the result using **ensemble Kalman filter**.
- Implemented SLAM then converted to point cloud for clustering, K-means clustering for object classification, and implemented PDAF for **object tracking and prediction**.
- Predicting object positions using a **probabilistic data association filter** provides valuable information for the path planning algorithm, enabling it to re-plan the path as needed.

Penalty Kick Motion Planning | *ITS Robotics Research Center* | Bachelor Thesis **Jan 2022 – June 2022**

- Developed a penalty kick **motion planning algorithm** for a humanoid soccer robot, applied inverse and forward kinematics to smooth and precise kicking trajectories.

- The application utilized **Bézier curves** to generate kick trajectories, which are then exported in a format compatible with the C++ simulator software.
- Implemented a **neural network architecture** to identify the optimal curve from a set of candidates. This approach ensured high precision when compared to manual planning, improving **efficiency and accuracy 30%** when kickball.

Image Classification and Analysis | *Singularity Analysis* **Nov 2021 – Dec 2022**

- Built an image classification model using CNNs to assess room cleanliness, fine-tuning pre-trained models like VGG16 and ResNet50 to distinguish between clean and messy rooms.
- Developed a facial emotion classifier using CNNs, optimized with genetic algorithms, and fine-tuned VGG16 and ResNet50 for accuracy.
- Creating a model to detect red light intersections using CNNs, with pre-trained models like MobileNet and YOLOv3, to improve road safety and monitor users.

Robot Medical Assistant ITS-Airlangga (RAISA) | *ITS Robotics Research Center* **Nov 2020 – March 2021**

- Develop **machine learning** to recognize patients, doctors, and nurses based on hospital databases and use **image classification** for more specific recognition.
- Robots are installed with a **multi-sensor obstacle detection system**, combining distance sensors, LiDAR, and odometry data to map the corridor's hospital and plan an efficient path to achieve goals.
- Implemented an image analysis utilizing TensorFlow for real-time mask detection and temperature screening achieved **99% success rate detection**.

Honors & Awards

- Best Presenter at International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE) 2024
- Received research funding for two consecutive years 2022 & 2023 from the Electrical Engineering Department.
- Institut Teknologi Sepuluh Nopember Fresh Graduate Scholarship Awardee.
- Institut Teknologi Sepuluh Nopember Fast Track Scholarship Awardee.
- Gold medalist in Pekan Ilmiah Nasional (PIMNAS) 2022 in presentation class.
- Received research funding for scientific papers in 2022 from the Ministry of Education and Culture.
- Top ten outstanding students in the Electrical Engineering Department 2021.

Certificates

AI for Medical Diagnosis | *DeepLearning.AI* **October 2024**

- Developed convolutional neural networks (CNNs) for medical image classification and segmentation, specializing in diagnoses of lung and brain disorders.
- Gained practical experience in applying machine learning algorithms to real-world healthcare problems, focusing on both predictive modelling and treatment outcome analysis.

Data Science and Machine Learning | *Udemy* **March 2021**

- Implemented machine learning algorithms (Logistic Regression, Random Forests, Decision Trees, SVMs, K-Means Clustering) and used Scikit-Learn for efficient model development, training, and evaluation, with experience in neural networks for predictive modelling and classification.
- Proficient in Python for data science, utilizing libraries like Pandas for data analysis, NumPy for numerical computation, and Matplotlib, Seaborn, and Plotly for data visualization.

TensorFlow 2.0: Deep Learning and Artificial Intelligence | *Udemy* **June 2020**

- Skilled in key ML and DL algorithms (ANNs, CNNs, RNNs) for applications in time series forecasting, recommendation systems, and NLP/computer vision, utilizing GANs for image generation and transfer learning for classification.
- Experienced with deploying models via TensorFlow Serving for API integration and TensorFlow Lite for mobile compatibility, employing optimization strategies for large-scale workflows.

Conference & Proceedings

[1] "**Dynamics Object Tracking for Mobile Robots in Indoor Environments with Crossing Path**," 2024 8th International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE), 2024, pp. 387-392, doi: 10.1109/ICITISEE63424.2024.10730030.

[2] "**Environmental Localization and Detection Using 2D LIDAR on a Non-Holonomic Differential Mobile Robot**," in IET Conference Proceedings, Institution of Engineering and Technology, 2023, pp. 277–283. doi: 10.1049/icp.2023.1792.

[3] "**Obstacle Avoidance System on Autonomous Car Using D3QN**," in 2023 14th International Conference on Information and Communication Technology and System (ICTS), 2023, Institute of Electrical and Electronics Engineers Inc., 2023, pp. 199–204. doi: 10.1109/ICTS58770.2023.10330873.

[4] "**Lane Keeping System using Convolutional Neural Network for Autonomous Car**," in 2023 14th International Conference on Information and Communication Technology and System (ICTS), 2023, Institute of Electrical and Electronics Engineers Inc., 2023, pp. 205–210. doi: 10.1109/ICTS58770.2023.10330834.