Irfan Tito Kurniawan

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Education

- **Institut Teknologi Bandung (Bandung Institute of Technology)** — Bandung, Indonesia
  M.Sc. in Electrical Engineering (Control and Intelligent Systems, Cum Laude); GPA: 3.79/4.00 — *Aug 2021 – Apr 2023*
  - Thesis: Radar-camera fusion-based 3D object detection for autonomous vehicles, supervised by Prof. Bambang Riyanto Trilaksono.
  - Thesis project: **An autonomous tram**, developed in cooperation with the Indonesian Railway Industry Company (PT INKA). I integrated the tram's autonomy subsystems and developed its embedded radar-camera fusion-based perception system, designed to deliver reliable 3D detections even under low-visibility conditions.
  - Thesis project: **ClusterFusion**, a radar-monocular camera fusion-based 3D object detector. It achieved the best NDS, mAOE, mAVE, and mAAE among all radar-monocular camera methods in the nuScenes leaderboard.

- **Institut Teknologi Bandung (Bandung Institute of Technology)** — Bandung, Indonesia
  B.Sc. in Biomedical Engineering (Cum Laude); CGPA: 3.78/4.00 — *Aug 2017 – Jul 2021*
  - Thesis: Autonomy for healthcare surface disinfection robots, supervised by Dr. Widyawardana Adiprawita.
  - Thesis project: **Soca**, an autonomous navigation system for ultraviolet-C germicidal irradiation (UVGI) robots, featuring an AMCL-based localization, an RRT*-based path planner, a spanning tree-based coverage planner, and a pure pursuit controller.
  - Thesis project: **Soca Octomap**, a method for simulating the irradiation coverage of UVGI systems in Gazebo, enabling optimal placement of static UVGI systems and route planning for mobile UVGI systems.

Research Experience

- **Dagozilla Robotics** — Bandung, Indonesia

  Team Supervisor — *Oct 2020 - Oct 2021*
  - Guided the development of **Dagozilla's autonomous soccer robots** for Robocup Middle Size League (MSL).

  Team Leader — *Jul 2019 - Oct 2020*
  - Led the development of **Dagozilla's new autonomous soccer robots** for RoboCup MSL, featuring improved localization, navigation, locomotion, shooting, and dribbling capabilities, thereby enabling new strategies.
  - Qualified for RoboCup MSL 2020 but did not compete because the event was canceled due to COVID-19.

  Electrical and Control Engineer — *Sep 2018 - Jul 2019*
  - Designed, manufactured, and wrote the code for the electrical and control systems of **Dagozilla's autonomous soccer robots** and **telepresence robot**.
  - Achieved first place and received the best strategy award in the regional level, and secured fourth place in the national-level Middle Size Soccer Robot League at the 2019 Indonesian Robot Contest.

- **Beehive Drones** — Yogyakarta, Indonesia

  Computer Vision Engineer Intern — *May 2020 - Aug 2020*
  - Benchmarked the performance of state-of-the-art visual SLAM and odometry algorithms on a standard dataset.
  - Implemented the VINS-Fusion visual-inertial odometry algorithm on a Jetson Nano for use onboard a quadrotor.

Journal Publication List

- **I. T. Kurniawan** and B. R. Trilaksono, "ClusterFusion: Leveraging Radar Spatial Features for Radar-Camera 3D Object Detection in Autonomous Vehicles," in *IEEE Access*, vol. 11, pp. 121511-121528, 2023, doi: 10.1109/ACCESS.2023.3328953.

Conference Publication List

- **I. T. Kurniawan** and B. R. Trilaksono, "Improving Radar-Camera Fusion-based 3D Object Detection for Autonomous Vehicles," *2022 12th International Conference on System Engineering and Technology (ICSET)*, Bandung, Indonesia, 2022, pp. 42-47, doi: 10.1109/ICSET57543.2022.10011030.
- A. Ammar, **I. T. Kurniawan**, R. N. Azizah, H. R. Yusuf, A. E. Nugroho, G. F. Mufiddin, I. Anshori, W. Adiprawita, H. A. Usman, & O. Husain, "Deep Learning for Lymphoma Detection on Microscopic Images," in *Proceedings of the 4th International Conference on Life Sciences and Biotechnology (ICOLIB 2021)*, 2022, pp. 203-215, doi: 10.2991/978-94-6463-062-6_20.
- **I. T. Kurniawan** and W. Adiprawita, "A Method of Ultraviolet-C Surface Irradiation Simulation and Evaluation," *2021 International Symposium on Electronics and Smart Devices (ISESD)*, Bandung, Indonesia, 2021, pp. 1-5, doi: 10.1109/ISESD53023.2021.9501868.
- **I. T. Kurniawan** and W. Adiprawita, "Autonomy Design and Development for an Ultraviolet-C Healthcare Surface Disinfection Robot," *2021 International Symposium on Electronics and Smart Devices (ISESD)*, Bandung, Indonesia, 2021, pp. 1-6, doi: 10.1109/ISESD53023.2021.9501737.
- A. F. A. Mubarok, ..., **I. T. Kurniawan**, ..., "Development of the Wheeled Soccer Robot Dagozilla Version 2.1 for the Middle Size League (MSL) Competition," *7th Indonesian Symposium on Robotic Systems and Control (ISRSC)*, Semarang, Indonesia, 2019.

Work Experience

- **Movel AI** — Singapore (Remote)
  Robotics Software Engineer — *Mar 2023 - Dec 2023*
  - Maintained and improved Movel AI's robot-agnostic robot navigation system Seirios RNS.
  - Developed custom robot navigation solutions according to the specific needs of the clients.
  - Responsible for the robotics team's DevOps and maintaining the codebase.
- **CAD-IT Consultants Asia Pte Ltd** — Bandung, Indonesia
  Mobile Robotics Engineer — *Jun 2021 - Jul 2022*
  - Designed the software architecture of CAD-IT's autonomous data center inspection robots, capable of capturing server rack images for monitoring and diagnostics.
  - Developed the robot's core functions including navigation, control, localization, and mapping.
  - Developed the robot's behavior trees, simulation environment in Gazebo, and simple web-based user interface.

Teaching Experience

Master's at Institut Teknologi Bandung — Bandung, Indonesia
EL4233 Fundamentals of Intelligent Systems & Control - Teaching Assistant — *Jan 2023 - May 2023*
EL5108 Intelligent Systems and Control - Teaching Assistant — *Sep 2022 - Dec 2022*

Bachelor's at Institut Teknologi Bandung — Bandung, Indonesia
EL2208 Problem Solving in C - Laboratory Assistant Coordinator — *Jan 2021 - May 2021*
EL2142 Digital & Microprocessor Systems - Laboratory Assistant Coordinator — *Sep 2020 - Dec 2020*
EL2208 Problem Solving in C - Laboratory Assistant — *Jan 2020 - May 2020*
EL4126 Robotics - ROS Workshop Teaching Assistant — *Oct 2019 - Dec 2019*
EL2142 Digital & Microprocessor Systems - Laboratory Assistant — *Sep 2019 - Dec 2019*

Skills

- **Languages**: English (full professional proficiency; TOEFL iBT 112/120), Indonesian (native), Javanese (native)
- **Programming Languages**: C++, Python, C, MATLAB, CUDA C/C++
- **Tools and Frameworks**: Linux, ROS, Git, CMake, Gazebo, RViz, Docker, GDB
- **Libraries**: PyTorch, OpenCV, NumPy, Matplotlib, Point Cloud Library (PCL), Eigen, TensorRT