PRAMODA PRABASWARA

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A final year engineering physics student who passionate in control systems, IoT (Internet of Things), robotics, and physics simulation with strong background in mathematics and physics.

Education

Bandung Institute of Technology Aug 2021 - Present
Undergraduate on Engineering Physics
Cumulative GPA: 3.59/4.00
Highlighted Courses: Automatic Control, Robotic and Automation, Machine Learning for Control, Intelligent System, Industrial Instrumentation, Industrial Internet of Things, Engineering Data Science

Experience

Bandung Institute of Technology Feb 2025 - Present
Research Assistant Bandung, ID

- Supervisor: Faqihza Mukhlish
- Developing simulation for swarm robot formation, consider as bachelor thesis
- *Skills: Matlab, Python, Control Engineering, Dynamic Modelling*

Australian National University Jun 2024 - Sep 2024
Visiting Researcher at RSES (Research School of Earth Science) Canberra, AU

- Supervisor: Prof Louis Moresi and Juan Carlos Graciosa
- Topic: Advanced Computational Modelling of Earth Systems (Computational on Tectonics Area)
- Developed computational tools using Underworld3 for groundwater flow simulation, focusing on stokes and darcy flow experiments.
- *Skills: Python, Computational Fluid Dynamics, Computational Geodynamics*

Honors & Awards

Ganesha Awards Nov 2024
Received an award recognizing outstanding academic and extracurricular achievement, granted to students who have excelled in various competitions across multiple disciplines.

Future Research Talent by Australian National University Feb 2024 - Sep 2024
Shortlisted by the Australian National University (ANU) as one of the top students and staff from Indonesia and India to conduct collaborative research in STEM fields at ANU.

2nd Winner on ASHRAE Setty Family Foundation Feb 2023 – June 2023
Applied Engineering Challenge
Compete as a team with total 6 members to make paper in developing Indoor Air Quality (IAQ). Featured with sensors to detect temperature, carbon dioxide, dust, and volatile organic compounds. Including main device (mechanical and electrical parts), IoT system, building HVAC automation systems, and adaptive fuzzy controller. Equipped with apps named AirSpot to maintaining, monitoring, and reporting air quality from sensors installed on the device.

Indonesia Robotics Contest (Autonomous Wheeled Soccer Robot), Round of 16 May 2023 – June 2023

Bronze Medalist on Thailand International Mathematical Olympiad, Heat Round Sep 2019

Projects

Design Controller of LQR, PID-LQR, Internal Model Principle, Pontryagin's Minimum Principle, and Reinforcement Learning for 3-DOF Helicopter Oct 2024 - Jan 2025

Consists of 3 students, developed and fine-tuned each controller to achieve precise trajectory tracking and stability under varying dynamic conditions. Conducted simulations and analyses to validate performance and optimize control parameters.

Model Predictive Control (MPC) for Trajectory Tracking of Quadrotor UAV Jan 2025

Developed a dynamic model of the UAV, formulated the trajectory tracking problem as a constrained optimization, and implemented the MPC controller to ensure precise and stable flight performance. Conducted simulations and performance evaluations in MATLAB to validate the controller's effectiveness in handling dynamic environments and maintaining stability under disturbances.

Food Classification for Machine Learning using YOLOv11 and RestNet Jan 2025

Designed and optimized the machine learning pipeline to achieve high accuracy in identifying and categorizing food items, leveraging advanced deep learning techniques. Ensured efficient model performance for real-world applications

Simulation and Optimization of Thermal Room Condition Based on OTTV (Overall Thermal Transfer Value) Oct 2024 - Jan 2025

Utilized OTTV to assess heat transfer through building envelopes, including walls, windows, and roofs, while adjusting parameters such as insulation, ventilation, and solar heat gain. Successfully optimized the building's thermal performance, minimizing energy consumption while maintaining optimal indoor conditions.

Analysis of HAZOP (Hazard and Operability Study) and LOPA (Layer of Protection Analysis) at Plant X Sep 2024 - Jan 2025

Identified and evaluated potential hazards and operational risks. Utilized HAZOP to systematically analyze process deviations and LOPA to assess the effectiveness of existing safety layers. Successfully identified critical risk factors and recommended improvements to enhance plant safety, operational efficiency, and compliance with industry standards.

Digital Twin PLC for Data Center Chiller Apr 2024 - Jun 2024

Designed and implemented PLC, HMI, and database system to monitor and visualize the chiller operations in a data center environment. The system enabled real-time data acquisition, historical logging, and performance tracking to support preventive maintenance and optimize energy usage.

Dry Skin Detector with Image Processing Apr 2024 - Jun 2024

Develop image processing tools with Matlab to detect dry skin based on its own texture, before and after lotion application. Collaborated with Pharmaceutical Department to evaluate their lotion product

Dehumidifier System for Copra Apr 2024 - May 2024

Designed a dehumidification system to optimize the drying process of copra (dried coconut meat). The system aimed to control humidity levels, reduce drying time, and improve product quality. Resulted in a more energy-efficient and consistent drying process, enhancing the shelf life and market value of the copra.

Peltier-PLC Based IoT Control Mar 2023 - May 2023

Developed an integrated system combining PLC, HMI, and database management to control conditional temperature using Peltier modules. Featured real-time monitoring, automated feedback control, and IoT connectivity for remote access and data logging. Designed for applications requiring precise thermal regulation with user-friendly interface and data traceability.

Android-ESP32 Based Controlled-MeArm Robot Mar 2023 - May 2023

Developed an arm robotic that has 3 DoF (degree of freedom) controlled with smartphone via android application and used ESP32 as microprocessor. The application was built by Kotlin and Android Studio, using bluetooth as communication that connects between android and ESP32.

Automatic Dispenser Nov 2022 - Dec 2022

Developed an automatic dispenser that is capable to detect glasses and minimizing the the probability of water spills using Light Dependent Resistor (LDR). This system is working fully with electrical components such as Power Circuit Board (PCB) and ESP32.

Organization

Engineering Physics Student Association (HMFT ITB)

Staff of Legislation Commission MPA Mar 2024 – Feb 2025

- Supervise the Executive Board's performance
- Establish general organizational guidelines
- Approve and amend the constitution and bylaws

Staff of Extracampus Division Mar 2023 – Feb 2024

- Maintain external relations
- Initiate external collaboration
- Develop alumni database for academic and professional purposes

Intern of Internal Relation Division Oct 2022 – Mar 2023

- Be an intermediary between Engineering Physics Student Association and parties inside university

Unit Robotika ITB

Head of Crew Development Aug 2023 – Sep 2024

- Assess and identify crew training needs and continuously improve programs to enhance operational efficiency and staff performance.
- Collaborate with external parties to implement robotics in daily basis

Indonesia Engineering Physics Student Forum (FKMTF Indonesia)

Head of Creation, Innovation, and Collaboration Aug 2023 – Sep 2024

- Organize workshops, discussions, and projects that encourage cross-disciplinary collaboration.
- Facilitate networking opportunities, fostering connections between students, faculty, and external partners.
- Develop and implement innovative programs that enhance student engagement and creativity.

GAMAIS ITB

Staff of Human Development May 2023 – Feb 2024

- Develop and organize structured mentoring session for new student 2023 cohort
- Design and implement programs on leadership, critical thinking, and communication

Dagozilla ITB (Autonomous Wheeled Soccer Robot Team)

Mechanic Staff Aug 2022 – Jul 2024

- Developed mechanical design using CAD software
- Build and test mechanical prototypes to evaluate motion, durability, and integration with electrical and control system
- Diagnose and repair mechanical failures during testing and competition

Mechanics Intern Apr 2022 – Aug 2022

- Developed an autonomous ultrasonic sensor robot

- Designing and manufacturing main body of robots

Ajak Gerak Aug 2021 – Dec 2021
Math Tutor
- Teaching math for High School through for upcoming university examination
- Conduct initial assessments to understand each student's strengths, weaknesses, and areas that need improvement

Teaching

System Dynamics Sep 2024 - Jan 2025
Assistant Lecturer
- Evaluate student work, grade assignment, quizzes, and exams (70+ students)
- Assist in preparing students for upcoming exams
- Deliver the material that related to physical modelling, transfer function, response systems, and bond graph

Engineering Computation Feb 2024 - Jun 2024
Laboratory Assistant
- Evaluate student work, grade assignment, quizzes, and exams (70+ students)
- Assist in preparing students for upcoming exams
- Deliver the material that related to numerical methods for engineering

Introduction to Engineering Design Jan 2023 - May 2023
Assistant Lecturer
- Evaluate student work, grade assignment, quizzes, and exams (60+ students)
- Assist in preparing students for upcoming exams
- Deliver the material that related to engineering fundamental, and ethics

Skills

Soft skill: Adaptability, Communication, Leadership & Teamwork, Problem Solving, Critical Thinking
CAD: Autodesk Inventor, Solidworks
Programming: Python, MATLAB
Engineering: Control Engineering, Computational Geodynamics, Computational Fluid Dynamics, Dynamic Modelling, Image Processing, HMI Design, PLC
Language: English (Advance), Indonesia (Native)