BANAR PAMBUDI

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SUMMARY

A 5th semester Electrical Engineering student at Diponegoro University with an interest in Web Development and Robotics. He has programming skills using Python, C++, Assembly, JavaScript, HTML/CSS, Tailwind, and basic SQL. He is accustomed to developing web applications and understands the concept of controlling microcontroller-based systems and robotics. He has problem-solving, critical thinking, analytical, meticulous, detail-oriented, and communicative skills. He is ready to contribute to projects involving interactive web development and robotic systems based on programming and the latest technology.

PROJECT

Anomaly Report Form Website, *Independent Project (Collaboration with peers)* July 2025

- Developed a Google Apps Script-based reporting application to manage morning and afternoon anomaly reports in a structured manner. The system features automatic input validation and timestamps to ensure accurate and consistent data entry.
- Integrate the app with Google Sheets so every report is instantly saved, organized, and summarized by date or shift. This simplifies daily monitoring and report recaps for the team.
- Designing a simple and easy-to-use web form interface, while ensuring cross-device accessibility (desktop and mobile). This project was developed as a practical solution to support the efficiency of operational documentation processes.

Matrix Calculator – Static Web Application, Personal Project August 2025

- Develop a static web application Matrix Calculator using HTML, CSS, and JavaScript to perform basic matrix operations such as addition, subtraction, multiplication, and inverse.
- Design a responsive and interactive interface so that users can enter matrix data easily. dynamic and directly see the calculation results on the web page.
- This project was created as a self-learning tool to deepen understanding of linear algebra concepts. while honing your front-end web development skills.

Streamlit Matrix Calculator, Academic Projects - Linear Algebra June 2024

- Working on an academic project in the form of a Streamlit-based Matrix Calculator to facilitate calculations basic matrix operations such as addition, subtraction, multiplication, determinants, and inverses.
- Using the Python programming language with library support such as NumPy for numerical computations and Streamlit for building interactive web interfaces.
- This project is designed as part of a college assignment, aiming to apply the concept of linear algebra in the form of practical applications while improving Python-based application development skills.

Portfolio Website (Beta), *Personal Project* February 2024

- Developing a Portfolio Website (Beta) as a self-learning tool to practice the basics of basic web development using HTML, CSS, and Bootstrap.
- Design a responsive display with a page structure that includes Home, About, Projects, and Contact, to train understanding of interface design and user experience.
- This project serves as an initial step in exploring front-end development, as well as a medium for showcase other projects in a digital portfolio format.

Automatic Hand Dryer Simulation, Academic Project - Microprocessor System Design May 2025

- Working on an academic project on Automatic Hand Dryer Simulation in the Microprocessor System Design course, with programming using Assembly language (.a51) for microcontrollers.
- Designing an infrared sensor-based system that can detect the presence of hands, then control them. fan/motor automatically turns on and off according to conditions.
- This project applies the concept of interfacing hardware with low-level programming, so that strengthen understanding of microprocessor architecture and simple automation system design.

Automated Parking System Simulation, Academic Project - Microprocessor System Design May 2025

- Working on an academic project on Automatic Parking System Simulation in the Microprocessor System Design course, with programming using Assembly language (.a51) for microcontrollers.
- Designing an infrared sensor-based system to detect incoming and outgoing vehicles, as well as displays the number of available parking slots on the LCD display.
- This project applies the concept of interfacing sensors and actuators with microcontrollers, low-level programming, and designing simple automation system logic to support efficient parking management.

YOLOv5 Object Detection in ROS2, Organization Project May 2025

- Working on YOLOv5 based Object Detection organization project in ROS2 as a member of Vision division Programming in the EWS Bascorro (Humanoid Soccer Robot) team.
- Integrating the YOLOv5 model with the ROS2 ecosystem using Python, OpenCV, and rclpy to support robot perception capabilities, including real-time ball, goal, and player detection.
- This project focuses on developing a reliable and modular computer vision system, while also training skills in robotics programming, image processing, and the implementation of deep learning algorithms in autonomous systems.

YOLOv12 Object Detection in ROS2, Organization Project May 2025

- Working on YOLOv12 based Object Detection organization project in ROS2 as a member of Vision division Programming in the EWS Bascorro (Humanoid Soccer Robot) team.
- Implemented the YOLOv12 model with ROS2 integration using Python, OpenCV, and rclpy to improve the accuracy and speed of real time detection of objects such as balls, goals, and players.
- This project aims to optimize the perception capabilities of humanoid robots in robot soccer matches, while strengthening experience in the fields of computer vision, deep learning algorithm integration , and programming of autonomous robotics systems.

EDUCATION

DIPONEGORO UNIVERSITY, Semarang City August 2023 – Present
Bachelor of Electrical Engineering with GPA: 3.55/4.00

- **Concentration**: Information Technology.
- **Related Courses**: Algorithms and Programming, Databases, Intelligent Computing, Internet of Things, and etc.

ACHIEVEMENT

- **GEMASTIK XVII**, Semarang State University (UNNES) August 2024
  Participants in the Programming division by Pusat Prestasi Nasional, Kemendikbudristek through BPTI.
- **Airlangga *Business Plan Competition***, Airlangga University September 2024
  Semi-Finalist of Business Plan Competition by Airlangga Business Forum (ABF).
- **Indonesian Robot Contest (KRI),** Muhammadiyah University of Surakarta (UMS) July 2024
  Entered the National Top 8, KRSBI-H Division (Humanoid) by Kemendikbudristek.
- **GEMASTIK XVIII**, Telkom University - Bandung August 2025
  Participants in the Smart City division by Dit. Belmawa, Ditjen Dikti, dan Kemendiktisaintek.

ORGANIZATION

URDC EWS Bascorro Team, Semarang City January 2024 – August 2024
Vision Programmer Staff

- Developing and fine-tuning an OpenCV-based vision system to support the humanoid robot's ability to detect and recognize important objects on the field, such as the ball, goal, and opposing players.
- Labeling image datasets and compiling YOLOv5-compatible annotation files , thereby speeding up the training process of object detection models and improving the accuracy of vision systems.
- Perform maintenance and updates on the OpenCV system on humanoid robots, including bug fixes, algorithm adjustments, and performance optimization to ensure the system remains stable and ready for use in competitions.

URDC EWS Bascorro Team, Semarang City September 2024 – September 2025
Senior Staff Vision Programmer

- Contributed to the humanoid soccer robot team by developing the integration of the YOLOv12 source code into the ROS2 environment, so that the robot is able to recognize objects (such as the ball, goal, and opposing players) in real-time.
- Optimize the performance of YOLOv12-based object detection to improve identification accuracy and computational efficiency, thereby supporting fast robot decision-making in matches.
- Mentoring junior members in the vision programming division, including providing technical direction, explaining computer vision concepts , and assisting in the implementation of object detection algorithms in robotic systems.

CERTIFICATE

- ***International Webinar "Successful Career Planning for 2 roles"*** September 2023
  International Webinar Program by SmartPath.
- **Learn Website Coding for Beginners** October 2023
  Online class "Learn Website Coding for Beginners" by Mounev Academy.
- ***Web Development Series 3.0*** July 2024
  Programming and Coding Learning Webinar by Dibimbing.id.
- **Top 8 National Indonesian Robot Contest (KRI)** July 2024
  National Top 8 Award in the KRSBI-H Division by Kemendikbudristek.

ABILITY

- Languages: Indonesian (Native), English (Intermediate, TOEFL ITP 477 – ETS, 2023).
- *Tools*:
  - Python (pandas, matplotlib, streamlit) – for data analysis, visualization, and building simple applications.
  - HTML, CSS, Bootstrap, Tailwind, JavaScript – basic to advanced for modern web development.
  - C++ – the basics of programming and algorithm development.
  - ROS2 & OpenCV – development of computer vision systems on robots.
  - Assembly (.a51) – microcontroller programming for microprocessor-based system simulation.
  - SQL (MySQL / PostgreSQL) – basic queries for data processing and analysis.
  - Google Workspace (Docs, Sheets, Slides, Forms, Apps Script) – online collaboration, automation, and cloud-based data processing.
  - Git & GitHub – version control and project collaboration.
  - Microsoft Office (Word, PowerPoint, Excel) – used for document processing, presentations, and basic data analysis.
- Competencies:
  - IoT and Programming (Academic basis of lectures at UNDIP).