Yudhistira Yoga Semeru

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Summary

M.Sc. graduate in Visual Computing from Saarland University with 3.5 years of industry experience and over 4 years of academic research in software engineering, robotics, and computer vision. Focused on building lightweight, high-performance solutions.

Work Experience

CAD-IT Consultants (Asia) Pte Ltd, Computer Vision Engineer (Indonesia) **Nov 2020 – Dec 2022**
Team Lead of Computer Vision & Augmented Reality (Indonesia) **Dec 2022 – Apr 2023**

- Led 4 engineers to deliver projects and products for South-East Asia and Europe clients in visual inspection for manufacturing sector.
- Developed 14 state-of-the-art deep learning solutions and scalable applications for object detection, image segmentation, anomaly & defect detection, hand gesture recognition, warehouse drone, operator guidance system, indoor navigation systems, object tracking, AR building interior viewer, and vehicle data acquisition (OCR). This includes microservices technology stack with real-time data communication protocols for seamless deployment and integration with an in-house industrial IoT solution.
- Awarded as one of the top 10% employees based on the 12-months contributions for the company's growth.

Multipolar Technology, Application Developer (Indonesia) **Nov 2019 – Nov 2020**

- Implement API protection system using third-party enterprise provider, enabling biometric and multi-factor authentication for one of the largest banking applications in Indonesia, including the software setup in baremetal deployment and load testing on banking API.

Bandung Institute of Technology, Mechatronics laboratory assistant (Indonesia) **Aug 2018 – June 2019**

- Taught the 2nd, 3rd, and 4th year of Mechanical and Mechatronics Engineering students about the laboratory work of electrical components, PLC, and microcontroller system (Arduino).

Robomarine Indonesia, Robotics Simulation Intern (Indonesia) **June 2018 – Aug 2018**

- Optimized Autonomous Underwater Vehicle (AUV) design using Computational Fluid Dynamics (CFD), allowing redesign and simulated the AUV based on the most effective design parameters, resulting in less fluid drag and allowing for a longer underwater operating period by 306% of its initial design.

Research Experience

Universität des Saarlandes, Thesis research (Germany) **August 2024 – July 2025**

- Developed a real-time rendering solution for neural heterogeneous volumes, improved performance by 1600% and reduced volume data size by 99.6%.
- Achieves stable 1080p path tracing performance at ~30-60 FPS, even with highly dense volume data.

Bandung Institute of Technology, Robotics Engineer (Indonesia) **Sept 2016 – Nov 2019**

- Led and advised the mechanical team of 8 engineers to design and develop 9 autonomous mobile soccer robots and a telepresence robot.
- Developed a custom omnidirectional camera system using a catadioptric mirror, ray-tracing simulation for wide-angle visual perception, and CNC manufacturing. It enables scene segmentation over an entire field with only a fraction of the original device price (<2%). This includes an image processing pipeline to detect ball and segment playing fields, achieving real-time performance ~30FPS and suitable for remotely tuning the parameter.
- Designed and integrate multimodal sensor data (IMU, compass, wheel odometry, omnidirectional camera, and depth camera to enable robot perception and navigation by sensor fusion.
- Conduct bachelor's thesis on design and control system of ball-handling mechanism, resulted in a robust control algorithm and is generalizable to a wide range of design. This fulfils the requirement of RoboCup Middle-Sized League, and is able to keep the ball with the high moving speed of the robot (~6m/s).
- Ensure research schedule and manufacturing pipeline in coordination with other division (electronics and software), including hardware development lifecycle (CAD design, simulation, manufacturing vendors, final assembly, and testing)

Education

M.Sc., Visual Computing (Final semester), Saarland University **Apr 2023 – July 2025**

- Thesis topic: Neural-precomputed scattering for real-time rendering of heterogeneous volumes.
- Relevant coursework: Image Processing and Computer Vision, High Level Computer Vision, 3D Computer Vision, Computer Graphics, Reinforcement learning, and System Architecture.

B.Sc., Mechanical Engineering (minor in Mechatronics), Bandung Institute of Technology **Aug 2015 – Oct 2019**

- Thesis topic: Design and control system of ball handling mechanism for mobile soccer robots.

Top 5 Achievements

- **Talent Recognition Award (2022),** *CAD-IT Consultants (Asia) Pte Ltd, Indonesia.*
  Given to the top 10% contributor upon the company's growth.
- **The Winner of Accenture case challenge HackaTUM (2021),** *Technische Universität München (TUM), Germany.*
  An annual hackaton by TUM with given cases from various companies in München.

- **1st Winner and Best Strategy in Middle Size Soccer Robot at Indonesian Robotic Contest (2019),** *Ministry of Research, Technology, and Higher Education Republic of Indonesia.*
  The best team with autonomous gameplay in an annual football robotics competition between universities in Indonesia based on Robocup Middle Sized League (MSL).
- **Mechanical Engineering Scholarship Awardee (2018-2019),** *Mechanical Engineering Alumni Association '08*
  A final year scholarship given for selected mechanical engineering student based on academic performance.
- **3rd Winner of Game Development Competition (2018),** Faculty of Computer Engineering, Nopember Institut of Technology.
  Developed a stealth RPG Android-based game.

Top 5 Publications

- **Development of the Wheeled Soccer Robot Dagozilla Version 2.1 for the Middle Size League (MSL) Competition.**
  The Indonesian Symposium on Robotic Systems and Control (ISRSC) 2019
- **Development of Dagozilla's Version 2 Wheeled Soccer Robot for the Middle Size League (MSL) Competition.**
  The Indonesian Symposium on Robotic Systems and Control (ISRSC) 2018
- **Hand Sign Translating Apparatus (HASTA)**
  Physics Contribution Seminar (SKF) 2018
- **Earthquake Measurement Device using MPU6050 Accel Sensor in Unbalanced Mass-based prototype**
  Physics Contribution Seminar (SKF) 2018
- **Development of Wheeled Soccer Robot Platform**
  The Indonesian Symposium on Robotic Systems and Control (ISRSC) 2017

SKILLS

- **Programming Languages**
  Python, C++, C#, C, Java, JavaScript.
- **Machine Learning & Computer Vision**
  PyTorch, TensorFlow, OpenCV, TensorBoard, MLflow, Weights & Biases (Wandb), Tinycuda-nn.
- **Rendering & Graphics**
  CUDA, OptiX, NVIDIA Nsight Compute, Unity3D, Blender3D, Qt++.
- **Robotics & Embedded Systems**
  Arduino, STM32 Nucleo (Mbed), ROS 1, PLC.
- **3D Modeling & Simulation**
  Autodesk Inventor, Solidworks, Ansys, AutoCAD, MATLAB.
- **Deployment, DevOps & MLOps**
  Docker, Apache Airflow, Minio, Ansible, Jenkins, Baremetal.
- **Communication & APIs**
  gRPC, REST API, WebRTC, RTMP, WebSocket.
- **IDEs & Development Tools**
  Android Studio, Vuforia.