Raphael Wiswa Santoso Samosir

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SUMMARY

A dedicated, detail-oriented, visionary, and highly adaptable person with a growth mindset. Experienced in various projects about PV Systems, Electronics, and Semiconductor Technology. I've worked on PV power plant design for 37 provinces at P3TEK ESDM, Electrical Engineer Intern at PLN Nusantara Power, IC development at Polytron, and feasibility studies for Central Kalimantan's government with Karya Betang Mandiri. With all my projects experiences, I have experienced at using ETAP, AutoCAD Electrical, making BoQ and technical specification, PV System Design using Helioscope and PVSyst, and also conduct feasibility study in several projects. With my diverse experiences in another fields, I have gotten two sides of electrical engineering. So that I can thrive in dynamic environments, adapt quickly to new challenges, and continuously seek growth through hands-on experiences in both engineering and research. I am always open to collaborating on diverse projects, both within and beyond my core areas, as I enjoy learning new things and eager to take on new challenges beyond my current expertise.

WORK EXPERIENCE

Karya Betang Mandiri (Project Consultant)

Jakarta, Indonesia ***Expert Assistant*** Jul 2023 - Sep 2023

- Worked to be an Assistant of Expert Advisor. Assisted for a Project of Central Kalimantan's Government to conduct a market research to explore business opportunities through market sounding in Central Kalimantan.
- This project was focused on Feasibility Study for Market Sounding.
- Supported Expert Consultant in data collection and analysis of each feasible market in Central Kalimantan. Also performed data processing from raw data so it would be easier to analyze.

Ministry of Energy and Mineral Resources of the Republic of Indonesia (Project Consultant)

Jakarta, Indonesia ***Technical Engineer*** Oct 2023 – Jan 2024

- Responsible for conducting feasibility studies and preparing comprehensive technical and financial reports for the implementation of rooftop solar power systems (PLTS Atap) on 130 government buildings across 37 provinces in Indonesia. The project was commissioned by the Center for Research and Development of Electricity, New and Renewable Energy, and Energy Conservation (P3TKEBTKE), under the Ministry of Energy and Mineral Resources.
- Designing PV (Photovoltaic) Power Plant for government offices at 37 provinces of Indonesia with a team consisting of 10 peoples using Helioscope.
- Conducting BoQ preparation, electrical datasheet and technical specifications for PV Systems by considering the technical needs and budget.
- Writing report and analysis of a PV design feasibility study based on the location, electricity capacity needed, BoQ, and capacity of electricity that has been installed.

PLN Nusantara Power (Muara Karang Power Plant)

Jakarta, Indonesia ***Electrical Maintenance Engineer Intern*** Jul 2024 – Aug 2024

- Assisted in the electrical maintenance of power generation systems at Muara Karang Power Plant. Gained hands-on experience in gas and steam power plant electrical maintenance, including Synchronous Motor Maintenance, Chlorine Pipe Maintenance, Circuit Breaker Inspection, Electrical Panel Development, and Electrical Disturbance Simulation of a Power Plant using ETAP.
- Conducted performance analysis and troubleshooting of power plant equipment to ensure optimal efficiency.
- Assisted engineers in monitoring and maintaining electrical systems within the power plant.
- Collaborated with professionals to understand the challenges and innovations in power plant operation and maintenance.

Universitas Pertamina

Jakarta, Indonesia ***Basic Programming Lab. Assistant*** Oct 2022 – Jan 2023

- Guided and taught 37 Freshmen of Electrical Engineering Universitas Pertamina to explore basics of Python Programming and troubleshooting when there were any errors on the program.

Jakarta, Indonesia ***Basic Physics Tutor*** Jan 2023 – Jul 2023

- Taught 50 students of Petroleum Engineering Universitas Pertamina about electromagnetic physics.

Jakarta, Indonesia ***Numerical Computation Lab. Assistant*** Nov 2023 – Feb 2024

- Accompanied and guided 40 Sophomore of Electrical Engineering Universitas Pertamina to learn and explore how to program a numerical approach of a problem using Gaussian Method, Taylor and Maclaurin Series, Jacobi Iteration Method, and Bisection Method using C++ Programming Language.
- Has been a coordinator to lead 4 Lab. Assistant including myself to work professionally.

Jakarta, Indonesia ***Digital System Lab. Assistant*** Mar 2024 – Jul 2024

- Accompanied and guided 40 Sophomore of Electrical Engineering Universitas Pertamina to explore the practical lesson of digital system theory, such as logic gates, latch, flip-flop, and FPGA (Field-Programmable Gate Array).

- Being a coordinator to lead 5 Lab. Assistant including myself to work profesionally.

Hartono Istana Teknologi (Polytron)

Kudus, Indonesia ***IC Design Engineer*** Sep 2024 – Dec 2024

- This internship program is a part of MSIB (Magang dan Studi Independen Bersertifikat) from Ministry of Education, Culture, Research, and Technology of Indonesia. With collaboration between Hartono Istana Teknologi and ICDeC (Indonesia Chip Design Collaborative Center), this program has trained 50 students of 11 universities across Indonesia (Selected 50/334 students).
- Gained experience in VHDL/Verilog coding, synthesis, and timing analysis for FPGA-based prototyping.
- Learned full ASIC and FPGA design flow, from concept to post-layout verification, bridging analog and digital integration.
- Developed practical projects including an ANN hardware accelerator on Xilinx Kria KV260, a 2.4 GHz RF receiver, and a 2-stage CMOS op-amp using Cadence GPDK 45nm, demonstrating hands-on skills in digital acceleration, analog/RF design, and real-world IC implementation.

LEADERSHIP EXPERIENCE

IEEE Student Branch Universitas Pertamina

Jakarta, Indonesia ***Project Manager*** Mar 2022 - Sep 2022

- Actively contributed to the foundational development of the newly established IEEE Student Branch at Universitas Pertamina. Also played a key role in promoting IEEE values and encouraging participation among engineering students through workshops, technical seminars, and social initiatives.
- Managed 3 series of Technology Talks. Worked with a small team to find a speaker, and made the event's concept. Conducted Terms of Reference (ToR) for speaker by considering the speaker experience and organizational needs.
- Had invited and persuaded Chief Impactful Program of a company to be a speaker by collaborating with Public Relations Department.

Jakarta, Indonesia ***Vice Chairman*** Sep 2022 - Sep 2023

- It was such a great journey for me and our team to build a well-baked system at IEEE UP SB by collaborated with the founding members to design the branch's organizational structure, membership engagement strategies, and early activity frameworks.
- A challenge for me and team to keep the system working properly. It should take 2 or 3 years to make this amazing organizational system, but we can make it in one year.
- Achieved award of IEEE SB Universitas Pertamina 2023 as "The Best Executive".

HMTE Universitas Pertamina

Jakarta, Indonesia ***Vice Project Leader*** Sep 2023 – Nov 2023

- AVENGER (Annual Event of Electrical Engineering) 3.0 is a series of event containing seminar and competition targeted for Senior High School students across Indonesia.
- Preparing for seminar and competition themed "Walking Through Renewable Energy: Future or Premature".
- Leading the team to work together to accomplish the aims of the event.

Jakarta, Indonesia ***Competition Specialist*** May 2022 – Dec 2022

- AVENGER (Annual Event of Electrical Engineering) 2.0 is a series of event containing seminar and competition targeted for Senior High School students across Indonesia.
- Preparing competition themed "Your Contribution to Build Smart City".
- Gathered ideas to choose the outline of the competition, made the registration form, led the technical meeting before the final of the competition, prepared the platform for competition.

Jakarta, Indonesia ***Event Specialist*** Jun 2022 – Sep 2022

- VOLTA 2022 was a webinar held by the Electrical Engineering Student Association of Universitas Pertamina (HMTE Uper)
- Gathered ideas on how to hold a webinar, created the outline of the webinar, and controlled how the webinar held.

RETRO Universitas Pertamina

Jakarta, Indonesia ***Head of Research and Competition Dept.*** Jan 2023 – Oct 2024

- RETRO (Rekayasa Teknologi Robot) UPER is a student activity unit focused on robotics technology advancement.
- Included as a part of the founding member to build new student activity unit in college for filed of study in robotics.
- Held and being a speaker for a robot development training program made for RETRO's member.
- Leading the RnC Dept. to do research and development for social media content, learning to be a speaker and trainer for the training program.

Heuri Cosmos Universitas Pertamina

Jakarta, Indonesia ***Event Specialist*** Apr 2022 – May 2022

- Has been an event specialist at Regional Meeting ILP2MI. Regional Meeting ILP2MI (Ikatan Lembaga Penalaran dan Penelitian Mahasiswa Indonesia) was an annual meeting of the National Students Research Association and in 2022, it was held by Heuri Cosmos and I was the event specialist there to manage the meeting to be on time and prepared until a small thing of the event.

Jakarta, Indonesia ***Logistic Specialist*** Mar 2022 - Apr 2022

- Has been a logistic specialist at TRANSFORMER 5.0. TRANSFORMER 5.0 was an annual event of Research Student Extracurricular Activities (Heuri Cosmos). Worked to prepare the meeting platform for webinar and anything needed.

EDUCATION

Universitas Pertamina

Jakarta, Indonesia **B.Eng. in *Electrical Engineering*** Sept 2021 - Aug 2025

- Received APERTI BUMN Full-Ride Scholarship Awardee (0.0027% acceptance rate).
- Maintaining 3.94/4.00 GPA while advancing leadership and technical skills outside and inside campus.
- Joining EDRG (Electronic Device Research Group) that focuses on material growth of semiconductor and electronic devices.
- Has done undergradute thesis with focus on design and implementation of Variational Autoencoder on FPGA with Inline-Array Architecture.

HONORS & AWARDS

APERTI BUMN Scholarship 2021

- APERTI BUMN Scholarship is a scholarship given by BUMN (Badan Usaha Milik Negara) University Alliance with passing rate of 0.000027 to be a student at a BUMN University.

First Winner & Best Paper of 10th AIC 2022

- 10th AIC (Airlangga Ideas Competition) was a paper competition held by Student Research Activity Unit of UNAIR (Universitas Airlangga).
- Paper titled TRAFO: Trash Classification and Monitoring Based on Computer Vision to Support City and Sustainable Residential.

The Best Executive of IEEE Universitas Pertamina Student Branch 2023

- Being the best executive of IEEE Universitas Pertamina SB 2023 among 4 executives (Chairman, Secretary, and Treasurer).

Presenter of Accepted Paper (1st Author) on ISPACS 2025 (International Conference)

- Paper titled Design and Implementation of an Inline Array Architecture for Variational Autoencoder Accelerator.

SKILLS & INTERESTS

Skills: Power System Modelling (ETAP), PV System Design (Helioscope, PVSyst), Electrical Design (AutoCAD Electrical), Coding (MATLAB, C++, Python), IC Design (Verilog HDL, LTSpice, Xilinx Vivado, Altera Quartus), PCB Design (Altium Designer, Proteus), project management, problem solving, Ms. Word, Ms. Excel, Ms. Power Point.

Language: Indonesian (native), English (intermediete)

Interests: Power system, analytics, renewable energy, electronics, semiconductor, IC Design

CERTIFICATION

Certificate of Competence in Electronics by BNSP (No. 95210 7421 0027301 2021 BNSP)

Technical Drawing using AutoCAD Electrical and Electrical Installation Training: Wye-Delta Motor Starter by Electrical Engineering Universitas Pertamina

ASEAN Data Science Explorers 2023 Enablement Session - SAP Analytics Cloud Training Session by ASEAN Foundation

PROJECTS

- VANALIKA: Photovoltaic Based Energy Harvesting using Sunflower Solar Tracker Optimization (bit.ly/VANALIKA)
- 12V - 24V Boost Converter for DC Voltage Step-Up
- IR Sensor-Based Line Follower Robot
- Star-Delta Starter Electrical Motor Starter Panel
- Temperature Controller using LM35 with Arduino-Based PID Controller Implemented using MATLAB
- ANN Hardware Accelerator Digital IC Implemented on FPGA Xilinx Kria KV260 (Case Study: Battery Condition Estimation)
- 2.4 GHz Radio-Frequency Receiver Analog Integrated Circuit Designed with Cadence (GPDK 045nm)
- 2-Stages Op-Amp Analog Integrated Circuit Designed with Cadence (GPDK 045nm)
- Variational Autoencoder Accelerator Integrated Circuit Design Implemented on FPGA Xilinx Kria KV260 for DNN-based Image Compression