

# David Pratama Widjaja, EIT

RENEWABLE ENERGY ANALYST | SOFTWARE DEVELOPER

✉ widjaja.david@gmail.com | 🏠 david-pw.com | 📺 DavidWidjaja-137 | 🌐 david-pw

## Skills

<b>Renewable Energy</b>	NREL SAM, PvSyst, Signal Trending Analysis, Fault & Event Analysis, Load Flow Calculations, pvlib, PyPSA
<b>Analytics &amp; Data Science</b>	Python (Pandas, NumPy, SciPy, Scikit-learn, Matplotlib, etc), PySpark, Tableau, MATLAB
<b>Software Development</b>	Python (Flask, Django, SQLAlchemy), Go, SQL, gRPC, HTML/CSS/JS, VueJS, Plotly Dash
<b>Cloud &amp; DevOps</b>	Amazon Web Services(AWS Certified Developer - Associate), Heroku, Terraform, Linux, Shell, Git, CircleCI
<b>Mechatronics</b>	SolidWorks, OnShape, LTSpice, Mechanical & Electrical Assembly, 3D printing
<b>Embedded Software</b>	C, Arduino, STM32, TI microcontroller, RF & Cellular modems, CAN bus analysis

## Work Experience

### Clir Renewables

Vancouver, BC

Renewable Analytics Software Developer

Apr 2023 - May 2024

- Supported the automation of a time-consuming, weekly internal process into a workflow on AWS Glue, leveraging Terraform IaaS, CircleCI, and Amazon Athena integrations with Tableau Server. Supported reliability improvements in data quality and anomaly identifications in Python and Go.
- Implemented a tool to benchmark performance across Clir's portfolio of solar farms, enabling the company to deliver market insights to clients.
- Implemented, using Plotly Dash, an internal tool to analyze, store, and visualize signal trending anomalies and power curve changes across hundreds of wind turbines, allowing analysts to identify and surface issues for clients.

### Clir Renewables

Vancouver, BC

Renewable Energy Analyst

June 2022 - Apr 2023

- Significantly improved the internal tooling system for solar analytics processes, by automating repetitive tasks, improving the code efficiency of several batch jobs by an order of magnitude, and generalizing our internal PV models to adequately represent a wide variety of farm configurations. Providing these incremental improvements allowed a rapidly-growing number of urgent and specific client requests to be delivered ahead of formal product releases, while maintaining an agile system for prototyping improvements.
- Designed and implemented several detectors to automatically classify inverter and combiner-level anomalies into discrete IEC conditions, which were accepted as features into the production Clir system.
- Supported the delivery of regular and ad-hoc client requests for analysis and reporting, led several client calls on their asset performance.

### Clir Renewables

Vancouver, BC

Renewable Energy Analyst Co-op

May 2021 - Aug 2021

- Developed and tested several anomaly detection and classification algorithms to quantify energy losses in utility-scale solar power plants, leveraging the use of NREL's PySAM and PvSyst models. These algorithms are used to provide rapid updates to clients about the performance of their assets, resulting in improved energy yields and rate of returns.
- Designed and implemented a flexible platform with Python, SQL and AWS infrastructure to accelerate the process of developing new anomaly detection and classification algorithms.

### Domestic

Richmond, BC

Product Designer - Mechatronics

May 2021 - Aug 2021

- Verified the functionality of safety critical firmware for marine vehicle control systems, under a tight release schedule. Maintained and updated several test benches for this purpose.
- Conducted CAN bus analysis and simulation using CAPL, Vector CANalyzer and CANoe. Developed a strong understanding of the J1939, NMEA2000 and CCP protocols for vehicle networking.
- Developed and tested firmware in C for an interactive Linux-based display used to configure and monitor other ECUs on a CAN network.

### Schneider Electric

Burnaby, BC

Solar Predictive Analytics Design Technician Co-op

Jan 2019 - Apr 2019

- Designed and implemented an interactive data synchronization/document management tool in Python, SQL and various web technologies to accelerate the process of writing and approving safety-critical maintenance guides for utility-scale solar power inverters.

## Education

The University of British Columbia

Vancouver, Canada

BaSc in Engineering Physics

2017 - 2022

International Major Entrance Scholarship

# Projects

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## Personal Project

### Indonesian Power Systems Analysis Project

Ongoing effort to model and analyze the Indonesian national power grid with the open source PyPSA toolkit.

Vancouver, BC

May 2024 - Now

## Personal Project

### Personal Website & Blog

Designed my own personal website and blog using GitHub Pages and the Jekyll templating engine.

Vancouver, BC

May 2022 - Now

## Personal Project

### Personal Finance Tracker

- Implemented, using Plotly Dash, a data analysis tool to aggregate and categorize my personal spending patterns across all my financial accounts
- Designed and implemented in Django a public web app to upload, update, categorize, and retrieve financial transactions.

Vancouver, BC

Oct 2023 - May 2024

## UBC Engineering Physics

### Robotic Leg Capstone Project

- Designed, using OnShape, a test stand which constrains and measures the motion of a robotic leg around spherical coordinates. Managed the bill of materials and led assembly of all mechanical components.
- Adapted an existing robot leg design for our use case, using OnShape. Led electrical and mechanical assembly of the robot leg.
- Developed an understanding of three-phase FOC control for induction motors. Researched the dynamics of underactuated, legged robots using the SLIP (Spring-Loaded Inverted Pendulum) model.

Vancouver, BC

Aug 2020 - Apr 2022

## UBC IEEE Power & Energy Society

### Co-chair of the UBC IEEE Power & Energy Society

- Co-organized the Power & Energy Mixer 2018, a social-networking event bringing together students and industry professionals from prominent energy corporations to discuss pressing issues pertaining to the future of renewable energy in British Columbia.
- Handled logistics, marketing and digital media considerations relating to the Power & Energy Mixer 2018 throughout the event-planning stage.
- Coordinated and delegated appropriate tasks to a small team of volunteers.
- Helped to improve public knowledge of the energy sector, as well as the implications of climate change on modern society.

Vancouver, BC

Sept 2018 - Aug 2019

## UBC Engineering Physics

### Engineering Physics Autonomous Robotics Competition 2

Developed a Python program to perform localization and movement of a robot within a ROS environment, using the NumPy and OpenCV libraries.

Vancouver, BC

January 2020 - May 2020

## UBC Solar Car Engineering Design Team

### Aeroshell Team Member

- Conducted bending analysis and material selection for carbon-fibre and core materials that will constitute the composite matrix for a new aeroshell for a new vehicle.
- Designed, using Solidworks, removable mounts for the wheel fairings of a solar-powered vehicle
- Contributed to the manufacturing of a fiberglass mold with a wet-layup procedure and a carbon fibre aeroshell with a vacuum-infusion procedure.

Vancouver, BC

Aug 2020 - Feb 2021

## UBC Solar Car Engineering Design Team

### Software Team Lead

- I started the development of an integrated vehicle environment simulator which analyzes real time solar irradiance, geographic information system (GIS) and weather data to improve our racing strategy.
- I led the ongoing effort to complete the telemetry system and to debug the firmware on the current solar vehicle.
- I trained new members of UBC Solar in embedded software development.

Vancouver, BC

Sept 2019 - Aug 2020

## UBC Solar Car Engineering Design Team

### Software Team Member

- Started development of a wireless telemetry system to facilitate real-time data transfer from our solar vehicle to a data visualization website, using 900 MHz radio modules and cellular chips.
- I co-wrote bare-metal firmware for the vehicle dashboard, the fault warning lights, and a speed control system on the STM32F1 micro-controller.

Vancouver, BC

Sept 2017 - Aug 2019

## UBC Engineering Physics

### Engineering Physics Autonomous Robotics Competition

- Designed and manufactured a chassis for a robotic drivetrain. Helped to tune the PID algorithm to enable line-following capability.
- Developed an algorithm to translate cylindrical coordinate designations into actuator positions for a robotic arm with 4 degrees of freedom.

Vancouver, BC

May 2019 - Aug 2019

**References available upon request.**