

**Moch Aucky Aisy Sudjono** | auckyqq@gmail.com | (62) 851-6186-1830 | [linkedin.com/in/auckyaisy](https://www.linkedin.com/in/auckyaisy)

Final year Petroleum Engineering student at Institut Teknologi Bandung with a strong foundation in data science, machine learning, and energy analytics, combined with hands-on experience in energy technology and optimization research. Skilled in data processing, automation, and visualization, I bring four years of programming expertise in Python, a practical understanding of production optimization, and project experience in areas like pipeline leak detection and carbon capture network optimization. Known as a design expert and recognized for my creative problem-solving abilities, I enjoy finding new and innovative ways to tackle complex challenges. Adaptable, collaborative, and data-driven, I am passionate about contributing to advancements in the energy industry by delivering impactful, data driven insights

### **Experience**

#### **Petroleum AI/ML Engineer – Peciko Smart Well Monitoring & Forecast Machine Learning**

| LAPI ITB | Feb 2025 – Present

- Contributed to a multi-objective physics informed machine learning initiative (Dataiku/Python) for Pertamina Hulu Mahakam's Peciko Smart Well project, focusing on Production Forecasting and Initial Rate Estimation, while supporting the overall project which also included Well Deliverability Estimation.
- Engineered and implemented the automated Decline Curve Analysis (DCA) workflow for historical production data, well event segmentation, fitting Arps parameters ( $q_i$ ,  $D_i$ ,  $b$ ) with high fidelity used as critical features for subsequent ML forecasting models.
- Developed highly accurate supervised learning models (Random Forest, GBT, XGBoost achieving  $R^2 > 0.98$ ) to predict DCA parameters based on well and reservoir properties, enabling robust production forecasting capabilities.
- Designed and built the ML pipeline for Initial Rate Estimation (Objective 3), utilizing features derived from Forchheimer equation analysis and well/reservoir data to train Gradient Boosted Tree models predicting initial gas rates with high accuracy ( $R^2 \sim 0.98$ , MAPE  $\sim 2.3\%$ ).
- Managed and optimized data workflows in Dataiku (handling  $>140$  datasets,  $>150$  recipes), implementing advanced feature engineering (e.g., Forchheimer linearization, DCA/initial rate parameter extraction, log transforms for  $D_i$ ) and rigorous model validation.
- Collaborated closely with Pertamina Hulu Mahakam engineers and LAPI ITB teams to integrate ML outputs for Objectives 2 & 3 into operational analysis and strategic planning.

#### **AI/ML Engineer - Pipeline Leak Detection System** | LAPI ITB | Oct 2024 – February 2025 (4 months)

- Developed and validated a hybrid statistical and Artificial Neural Network (ANN) based Leak Detection System (LDS) in Python for Pertamina Hulu Energi Jambi Merang's critical condensate pipeline.
- Successfully addressed the simulation-reality gap, a key challenge where initial models trained on OLGA simulation data underperformed against real-world drain test data, by implementing targeted data conditioning and robust modeling techniques.

- Implemented statistical anomaly detection models focused solely on pressure trends, achieving 97.54% accuracy in identifying potential leak events and pre-filtering data for targeted ANN analysis within specific pipeline segments.
- Engineered ANN models for precise leak location prediction within identified segments, utilizing inputs informed by both sensor data and the preceding statistical analysis.
- Executed critical data pre-processing pipelines, including cleaning, pressure state isolation, and feature transformations, significantly enhancing the quality and reliability of inputs for both model types.
- Integrated Monte Carlo simulations to rigorously assess and improve model robustness against inherent sensor noise and operational variability (simulating  $\pm 0.2$  psig pressure /  $\pm 60$  bbl/day flowrate uncertainty over 1000 iterations).
- Delivered a validated LDS solution meeting the project target, achieving an average leak location prediction error of ~990 meters ( $< \pm 1$  km target) on unseen drain test data through the combined statistical/ANN approach and probabilistic evaluation.
- Collaborated effectively within a multidisciplinary team (PHE Jambi Merang engineers, LAPI ITB researchers) via iterative testing and refinement, ensuring the final system met operational needs despite demanding project timelines concurrent with academic coursework (24 SKS).

**Thesis Research Intern** | PHE OSES | Aug 2024 – Present (5 months)

- Developing a predictive framework to assess sand production risk in hydrocarbon wells by correlating petrophysical properties (Cementation Factor 'M') with reservoir pressure (SBHP), aiming for proactive sand management strategies.
- Integrating diverse subsurface datasets including SCAL (M factor core data), Well Logs (GR, Sonic etc.), Production History (SBHP, PBHP, Rate, Sand/Scale failure records), Completion Data (Perforations, Deviation), ESP Failure Database, and Geomechanics Logs (for validation).
- Engineered a workflow to generate M-factor logs, developed a model to predict M from standard well logs calibrated against sparse SCAL data, enabling interval-by-interval M estimation where core data is unavailable.
- Established a novel critical sand condition relationship, created a regression model correlating the minimum M value within perforated intervals against the SBHP recorded at the first instance of sand production for historically problematic wells.
- Developing a sand production risk classification, utilizing the M-SBHP baseline to plot and classify all field wells, aiming to identify "Red Zone" wells requiring immediate sand control versus "Green Zone" wells suitable for predictive monitoring of minimum sand-free pressure.
- Performed in-depth data preparation, including merging log/core data, constructing historical sand/scale failure databases, and creating binary classifiers (sand/no sand) based on petrophysical indicators.
- Investigating ESP failure modes linked to sand/scale issues (identified via DIFA/Pulling records and reservoir fluid analysis) to provide contextual validation for sand production prevalence and impact.
- Collaborating with PHE OSES mentors and university supervisors to refine the theoretical framework, validate findings (using well remarks, critical rate literature, planned sonic log analysis), and ensure alignment with practical reservoir management needs

**CCS/CCUS Research Assistant** | Institut Teknologi Bandung | Mar 2024 – Jul 2024 (4 months)

- Developed Python-based solutions for optimizing CO2 pipeline networks, utilizing opensource APIs (OpenRouteService, Open Elevation, OSMnx) to minimize costs and avoid reliance on commercial alternatives.
- Implemented geospatial data analysis with OSMnx and Open Elevation API to determine optimal routes, considering factors like elevation and distance, while efficiently managing API usage through data chunking.
- Integrated OpenRouteService to calculate route distances and generate route geometries, providing essential parameters for cost estimation and feasibility analysis of CO2 transport infrastructure
- Contributed to the advancement of CCUS technologies by developing tools that enhance the efficiency and reduce the cost of designing and implementing CO2 transport infrastructure.

**Development - Subsurface Operation & Data Analytics** | PT Pertamina Hulu Indonesia | Feb 2024 – Jun 2024 (5 months)

- Analyzed daily production data with limited parameters for oil production optimization.
- Implemented machine learning models for classification, forecasting, and optimization tasks using statistics, mathematics, and petroleum engineering knowledge.
- Achieved 57.6% improvement in production accuracy, correcting overestimates by up to 1,260 barrels/month.
- Developed models for artificial lift selection and classifying lifting operational conditions for quick decision-making on pump optimization.
- Created presentations and reports to communicate findings, effectively visualizing data and analysis.

**Artificial Lift Management - Practical Work Intern** | PHE OSES | Jul 2024 – Aug 2024 (1 month)

- Designed ESP systems, determined optimal rate, component configuration, and setting depth, and performed nodal and sensitivity analyses.
- Utilized Excel, Python, Pipesim, and Prosper for ESP modeling.
- Conducted reservoir performance assessments, including data-limited cases, by evaluating similar wells.
- Performed decline curve analysis using machine learning methods to enhance data-driven ESP optimization.
- Developed presentations and a practical work report to communicate findings and recommendations.

**Head of Creative Media** | IATMI SM ITB | Apr 2023 - Apr 2024 (1 year 1 month)

- Directed the organization's design vision, creating and managing visual elements, increasing online engagement by 4.58% and followers by 150%.
- Led the development and implementation of a cohesive brand identity across all platforms. Utilized visual design, communication, and organizational skills to prioritize tasks, meet deadlines, and deliver high-quality results.

**Basic Thermodynamics A Assistant Lecturer** | Institut Teknologi Bandung | Aug 2023 - Dec 2023 (5 months)

- Supervised exams and assisted lecturers in evaluating quizzes and exams.
- Conducted tutorials on essential lesson materials to prepare students for exams.

**Senatorial Boards Internal Control** | HMTM "PATRA" ITB | Jun 2022 - Mar 2023 (10 months)

- Used OKR methodology to analyze and evaluate internal performance.
- Organized bonding events to strengthen internal camaraderie and unity.
- Actively contributed to Kongres KM ITB initiatives, representing student aspirations.

**Marketing** | FlashCampus (formerly Tentorin) | Jan 2022 - Sep 2022 (9 months)

- Developed brand visual marketing strategies, including brand identity and guidelines.
- Assisted in implementing branding objectives and created daily content.
- Increased social media followers by over 1,200 and expanded reach to over 3,500 users in four months.

**Fullstack Web Developer** | 2022 Village Development Programme ITB | Oct 2022 - Nov 2022 (2 months)

- Spearheaded the development of the 2022 Village Development Programme ITB website, showcasing B2 Jaya, Magetan's culture and tourism, handling the entire project lifecycle from concept to deployment.
- Developed the back-end using the Django framework (Python) to manage data, user interactions, and server-side logic, while implementing a responsive front-end with HTML, CSS, JavaScript, and Bootstrap.
- Integrated various APIs and databases to deliver dynamic content, contributing to a project recognized for its role in promoting rural development and cultural exchange.

**Peer Mentor** | OSKM ITB 2022 | Aug 2022 - Sep 2022 (2 months)

- Mentored new ITB students during a hybrid OSKM program.
- Facilitated student integration through presentations, online discussions, and in-person interactions.

**IBM-NCSA Batch 1 & 2 Facilitator** | Dicoding Indonesia | Oct 2020 & May 2021

- Facilitated the learning journey of ~1,980 scholarship recipients in Practical DevOps using IBM Cloud, Creating Cognitive Applications, Starting Programming with Python, and Machine Learning for Beginners.
- Collaborated to provide support, increasing successful DevOps certifications

### Projects

- **Multi-class classification of well lithology using well log data:** As the technical lead for model development within the team that secured 1st place (out of 21 Challenger teams) in the SLB's SCALE-UP 2025 Data Science Hackathon elimination stage (Lithology Prediction Challenge), I engineered the top-performing XGBoost model (Weighted F1 Score: 0.6547). This involved

classifying lithology from well logs (GR, DTC, RHOB, Resistivity, etc.) using physics-informed feature engineering based on petrophysical principles, which outperformed standard imbalance handling techniques tested on the challenging dataset. The role required intensive preprocessing, feature selection, model tuning, and sensitivity analysis under competitive deadlines.

- **Fivetival 2022 Website:** Full-stack development (Django, JavaScript, CSS, Bootstrap, PostgreSQL) and UI/UX design (Figma), implementing features for event registration, information dissemination, and online assessments with automated grading, managed the entire project lifecycle independently.
- **Don't Get to Close:** Python OpenCV ML app for measuring safe social distances during COVID-19 (Hackathon project).
- **Pemilu KPU V SMALA 2020:** Secure online voting platform (Django, HTML, CSS, JavaScript, reCAPTCHA) for SMAN 5 Surabaya's student council elections (2,000+ users).
- **Festive:** Interactive online concert and festival platform using Unity C# (Hackathon project).

### Education

**Institut Teknologi Bandung** | Bachelor of Engineering, Petroleum Engineering | 2021 – (Expected July 2025)

- 4 times Dean's List (1<sup>st</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 7<sup>th</sup> Semester)

**SMA Negeri 5 Surabaya** | High School Diploma, Science | 2018 – 2021

### Skills

- **Programming:** Python (Expert), Full-Stack Development (Intermediate), Machine Learning (Intermediate: Keras, TensorFlow), JavaScript (Intermediate), Django (Intermediate)
- **Data Science:** Data Analysis (Intermediate), Data Visualization (Intermediate), Data Engineering (Intermediate), Statistical Modeling (Intermediate), SQL (Intermediate), R (Basic), Microsoft Excel (Intermediate), PowerBI (Basic)
- **Petroleum Engineering:** Production Engineering, Production Optimization, ESP Design, Prosper, Pipesim, Reservoir Engineering, Reservoir Modeling (Petrel & Tnav), Decline Curve Analysis, Drilling & Completion, Well Performance Evaluation, Well Testing
- **Other:** REST API, PostgreSQL, Git, UI/UX Design, Visual Design, Problem Solving, Time Management, Operations Management (Intermediate), Communication (Expert: Written & Verbal), Teamwork, Leadership

### Courses & Certifications

- EF SET English Certificate 77/100 (C2 Proficient) - [V1X1wC](#) - **EF SET**
- Getting Started with Deep Learning - [REQsnMikTTqCS1qLr7k23g](#) - **Nvidia**