

# MUHAMMAD SALMAN MAULANA

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Computer Science student at IPB University specializing in Cybersecurity, Applied Machine Learning, and Trustworthy AI.  
Experienced in offensive security, time-series forecasting, mechanistic interpretability, and resilient software engineering.

## EDUCATION

### IPB University

*Bachelor of Computer Science*

Expected 2027

*Bogor, Indonesia*

- Relevant Coursework: Artificial Intelligence, Machine Learning, Cybersecurity, Data Mining, Software Engineering, Data Science, Human-Computer Interaction.

## TECHNICAL EXPERIENCE

### PIJAK 2026 — IBM SkillsBuild × Dicoding

*Advanced AI Track Cohort Member*

Feb 2026 to Jul 2026

*Indonesia*

- Selected as 1 of 600 from 20,000+ applicants (top 3%) for the intensive, project-based advanced Artificial Intelligence specialization track.
- Completed 900+ curriculum hours spanning Generative AI, model engineering, AI ethics, and collaborative multi-modal capstone deployment.

### Cyber Security IPB (CSI)

*Active Member / Security Researcher*

Sep 2023 to Present

*Bogor, Indonesia*

- Conducted vulnerability research, penetration testing labs, and threat modeling workshops within IPB University's cybersecurity community.
- Investigated attack surfaces and practical exploit mechanisms across web exploitation, cryptography, binary reverse engineering, memory corruption, and digital forensics.

### Capture The Flag (CTF) Player & Problem Setter

*Offensive Security Competitor & Challenge Author*

2023 to Present

*National / International*

- Authored, implemented, and validated multi-category security challenges as Problem Setter for **HackToday CTF (2024–2025)**, stress-testing exploit paths and containerized environments for hundreds of competitive participants.
- Competed across **39 national and international CTF tournaments** (12 international, 27 national), executing offensive security evaluations and adversarial problem-solving under strict time constraints.

## PROJECTS & LEADERSHIP EXPERIENCES

### Solar Power Forecasting Using PatchTST 🌀 | *Applied ML & Time-Series Research*

Jan 2026 to Jun 2026

*Multivariate solar irradiance and energy production forecasting with transformer architectures*

- Architected a multivariate time-series forecasting pipeline connecting residential PV power history with meteorological variables (irradiance, ambient temperature) to optimize battery storage dispatch and grid load planning.
- Implemented a channel-independent PatchTST transformer architecture in Python and PyTorch; benchmarked prediction quality against baseline models (DLinear, LSTM), achieving superior accuracy across MAE, RMSE, and MAPE metrics.

### AI Interpretability Research Reproduction 🌀 | *Trustworthy AI / Security Research*

Aug 2025 to Oct 2025

*Sparse Autoencoder reproduction for resolving superposition in transformer representations*

- Re-implemented Sparse Autoencoder (SAE) architectures using PyTorch and TransformerLens to isolate monosemantic feature directions and resolve polysemanticity in transformer residual stream activations.
- Evaluated reconstruction fidelity versus  $L_1$  sparsity trade-offs across activation datasets, linking mechanistic interpretability methodologies to model failure auditing and representation safety.

### Facility Booking System 🌀 | *Full-Stack Engineering*

Feb 2026 to May 2026

*Institutional resource management platform with finite-state machine approval workflows*

- Engineered an end-to-end resource reservation platform using React, Next.js, TypeScript, and PostgreSQL, modeling a deterministic state-machine lifecycle (submitted, reviewed, approved, rejected, recorded) for multi-tier approvals.
- Implemented strict Role-Based Access Control (RBAC), ACID-compliant database transaction locks to eliminate concurrent double-booking conflicts, and complete audit logging for administrative traceability.

### Residential Solar Monitoring Platform 🌀 | *Telemetry & Data Systems*

Oct 2025 to Jan 2026

*Real-time photovoltaic telemetry analytics dashboard and historical metrics pipeline*

- Architected an end-to-end solar telemetry dashboard using React, TypeScript, PostgreSQL, and Chart.js to visualize real-time photovoltaic yield, consumption profiles, and degradation trends.
- Structured schema-optimized time-series tables with automated aggregate queries, ensuring sub-second query latency and reliable system state telemetry under continuous data ingestion.

*Accessible, high-performance scripture reading platform with sub-second navigation*

- Workflow-CI-SML
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- | DevOps & MLOps Pipeline Jun 2026

- Constructed automated continuous integration (CI) pipelines using GitHub Actions, enforcing strict static analysis (SAST,

*Finalist in premier national cybersecurity and threat analysis competitions*

- **COMPFEST 16 CTF** — Finalist | *Universitas Indonesia* (2024)

- anantara & Arm Semiconductor Chip Design Training 2026

- Selected for national semiconductor initiative covering Arm compute architecture, instruction set architectures (ISA), SoC

Data Engineering Professional Certificate 2026

- Validated in scalable data pipelines, distributed ETL workflows, Snowflake architecture, and enterprise data warehousing.

- Certified Practitioner | Cisco Systems

## Zero Trust Cyber Associate (ZTCA) 2026

- Certified in Zero Trust architecture foundations, micro-segmentation, identity-based policy enforcement, and Zero Trust

- ParaGCP 2026 Recognition Award 2026

- Completed intensive Google Cloud Platform labs covering IAM governance, VPC networking, and cloud-native container deployment

## TECHNICAL SKILLS

## Trust Architecture

**Programming Languages:** Python, TypeScript, JavaScript, SQL, C/C++, Bash

**Methodologies & Practices:** Mechanistic Interpretability, Model Evaluation (MAE/RMSE/AUC), CTF Challenge Development, Red Teaming, Security Audits

DevSecOps, System Auditing