Taufik Adi Nugraha

Computational physicist turned data scientist

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Every job in this record has been the same job: build the thing that measures something nobody has measured yet, then check it against reality hard enough to find out where it breaks.

THE SHORT VERSION — if you read nothing else

Sixteen years computing the behaviour of materials from first principles – at **Institut Teknologi Bandung**, **The University of Osaka**, and for eight years at the **Max-Planck-Institut für Eisenforschung GmbH** in Düsseldorf. Then a deliberate change of subject: **Head of Data for the IoT division of Telkom Indonesia**, sensing the physical world instead of simulating it. Then an **election-day quick-count platform**, built alone, carrying thousands of polling stations to national media within hours of the polls closing. Now **advanced analytics and AI systems** at Bati Labs, and 10 public-data cases on openstudy.id.

> **Part of the doctoral research was published in Nature Communications** – Nature Communications 11, 4127 (https://doi.org/10.1038/s41467-020-17563-0) (2020), *"Exciton-driven change of phonon modes causes strong temperature dependent bandgap shift in nanoclusters"* – a combined experiment-and-theory study, in which he is **first-named of the two authors who carried out the DFT calculations**, the first-principles half of the work. Cited 51 times. The full record, conference contributions included, is at openstudy.id/cv/.

Institut Teknologi Bandung `2005 – 2009`

BSc, Physics

Bandung

Versatile Silicon Technologies `2010`

Computer Engineer

computer clustering, parallel computing

Institut Teknologi Bandung `2010 – 2011`

Research Assistant

Computational Materials Design group · Li-polymer battery

The University of Osaka `2011 – 2013`

MSc, Physics

Japanese Government (MEXT) scholarship via the International Physics Course · nuclear and particle physics · MSc thesis on ab initio g-tensor calculations · ISIR Nanoscience and Nanotechnology Center

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Max-Planck-Institut für Eisenforschung GmbH `2014 – 2021`

Computational Physicist

Wissenschaftlicher Mitarbeiter, Atomistic Modelling group, Düsseldorf · doctoral research on semiconductor nanoclusters, and on point defects at 3C-SiC/SiO_2 interfaces for silicon-carbide nanofibre solar cells · the affiliation on the Nature Communications paper · the institute is now Max-Planck-Institut für Nachhaltige Materialien GmbH

Telkom Indonesia `2022 – 2024`

Data Scientist → Head of Data, IoT

January 2022 to December 2024 · Jakarta · LoRaWAN networks for asset tracking · agriculture and livestock sensors · computer vision for crowd analytics, traffic and vehicle detection, farm monitoring · NVIDIA Jetson edge inference · Maps API for commercial prospecting

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KedaiKOPI (https://kedaikopi.co/) `2024 · ~4 months of work`

Quick-count platform — freelance, part-time

Built solo · two projects of about two months each, four months of work in total · pileg and pilpres on 14 February 2024, pilkada on 27 November 2024 · thousands of polling stations reporting by WhatsApp and SMS, validated on arrival, live dashboard and a feed to national media the same afternoon

Bati Labs (https://batilabs.ai) 2024 — now

Advanced analytics and AI

Recommendation engine · semantic search · diagnostic engine · MCP server for context engineering, used directly by senior management · multi-agent monitoring and resolution · AWS, GCP, Azure; Kafka, Debezium, Airflow, GitHub Actions

dakwah-lens.id (https://dakwah-lens.id) 2025 — now

Community project

Non-profit media monitoring and generative AI · 27 news outlets and 4 social platforms · every citation retrieved from a verified corpus, never generated

openstudy.id 2026 — now

Public-data case studies

Ten public-data cases · 42 checks written before the analyses ran

THE ARGUMENT — what actually transferred

One skill, four places

A CV that runs physics → telecommunications → elections → AI looks like four unrelated careers. It is not, and this is the evidence. Each row is a capability, lit in every era that used it. **Read it left to right:** the rows that begin in the physics column mostly do not stop there, and the one at the top – **model against measurement**, putting a computed answer beside a measured one and accounting for the gap – runs the entire width.

	PHYSICS 2005–2021	IOT 2022–2024	ELECTIONS 2024	AI SYSTEMS 2024–NOW
Model against measurement	●	●	●	●
Computer vision	●	●	●	●
Data engineering and cloud	●	●	●	●
High-performance and parallel computing	●			●
Simulation from first principles	●			
Statistics and machine learning	●	●	●	●
Full-stack applications and dashboards		●	●	●
Geospatial analysis		●	●	●
IoT, sensors and edge inference		●		
LLM systems, retrieval and agents		●		●
Real-time ingestion under deadline		●	●	●

CODE — public repositories

Things that run

`github.com/taufik-adinugraha/openstudy` openstudy.id: ten public-data cases with their pipelines, models and evaluation.

`github.com/taufik-adinugraha/dakwah-lens` Media monitoring and generative AI for Indonesian Islamic educators, non-profit. Python API and a TypeScript front end, containerised, with a migrated relational store.

`github.com/taufik-adinugraha/ai-quran` Speech recognition for Qur'an recitation, on a DeepSpeech model trained on roughly 600 hours from about 40 reciters. Begun September 2021 — a year before Whisper was released and made this class of thing a weekend project. It was not one in 2021.