

# Igor Kołodziej

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## EDUCATION

### BSc Data Science (Engineering)

10/2022 – 02/2026 (exp.)

Warsaw University of Technology, Faculty of Mathematics & Information Science

GPA: **4.3 / 5.0**. Selected Coursework: Algorithms & Data Structures, Machine Learning, Deep Learning, Databases, Big Data, Optimization, Computational Statistics, Stochastic Processes.

## EXPERIENCE

### Research Software Engineer

03/2025 – Present

Poznań University of Economics and Business (NCN OPUS 20 project)

**Project:** Census-like statistics for foreign-born populations – quality, data integration and estimation.

- Co-develop **NMAR** (CRAN R package): implement estimators from the literature behind a stable `nmr()` API.
- Run reproducible simulation studies and real-data experiments to compare methods and validate behavior.
- Presented the work at **uRos 2025 (Romanian NSI)** and **ElementsX 2025 (AGH)**.

### Product & Software Development (Student Venture)

01/2023 – 10/2024

Capitalize, Warsaw

- Shipped a demo mobile app to **Google Play (testing track)**; built backend features and APIs (**FastAPI**).
- Wrote Python scripts for basic analysis and visualizations of usage telemetry from **Amplitude exports**.
- Award: **2nd Place**, Enactus Poland National Competition 2023.

### Data Warehousing Intern

07/2023 – 09/2023

Accenture, Warsaw

- Maintained and extended an enterprise **SAP BW** data warehouse within production change processes. Used **ABAP** for fixes and enhancements.

## SELECTED PROJECTS (DATA/ML SYSTEMS)

### Real-Time Finance – Big Data Pipeline

[GitHub](#)

Docker Compose reproducible batch+stream pipeline (**NiFi, Kafka, HDFS, Spark, Hive, HBase**) integrating NBP daily FX rates with a live Binance trade stream. *Two-person team project; my scope: Spark ETL/analytics, data quality checks, Hive schemas, HBase serving.*

- Implemented Spark ETL for curated datasets and analytics (OHLC/volume, returns, rolling BTC–USD/PLN correlation); added run scripts for reproducible execution.
- Designed Hive external tables/views and added sanity checks for analytics outputs to catch data issues early.
- Built the serving layer: loaded analytical facts into HBase and integrated them with analytical views for fast key-based reads.

### Mamut – AutoML toolkit for tabular classification

[GitHub](#) · [Docs](#) · [PyPI](#)

Python package for tabular classification: preprocessing + Optuna-driven HPO, model comparison, and dynamic ensemble search, with HTML reports/plots. Packaged on PyPI with docs and CI/tests.

### NMAR – Estimation under nonignorable nonresponse

[GitHub](#) · [Docs](#) · [CRAN](#)

Open-source package providing a unified `nmr()` interface for NMAR estimation on i.i.d. data and complex survey designs. Includes multiple engines, vignettes, CI, and test coverage.

### QuantumRAG – Grover-inspired top-k selection for RAG

[GitHub](#)

Research RAG prototype: dense retrieval (FAISS + transformer embeddings) + GroverTopK selector (Qiskit Aer) with evaluation on **SQuAD 1.1**. Benchmarked `llama-3-8b / mixtral-8x7b / phi-3.5`. Grover matched classic selection in **99.11%** of cases with  $\approx$  **30 ms** overhead, and retrieval average of **0.29 s**.

## LEADERSHIP & OUTREACH

### President, Data Science Club

05/2024 – 05/2025

Warsaw University of Technology

- Led a student team organizing talks/workshops; hosted guests from Google, ING, and Allegro.
- **Co-organizer, ensembleAI hackathon** (2024, 2025): Managed sponsors, logistics, and on-site operations.

## SKILLS

|                        |                                                                |
|------------------------|----------------------------------------------------------------|
| <b>Data/Systems:</b>   | SQL, Spark, Hive, HDFS, HBase, NiFi                            |
| <b>Infra/Workflow:</b> | Docker, Linux, Git, GitHub Actions (CI)                        |
| <b>Programming:</b>    | Python, Java, R                                                |
| <b>Backend:</b>        | FastAPI, Spring Boot                                           |
| <b>ML:</b>             | PyTorch, scikit-learn, Transformers, Optuna                    |
| <b>Languages:</b>      | Polish (Native), English (C2, CAE Certificate), German (Basic) |