Mateusz Nowaczek

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EDUCATION

AGH University of Science and Technology

B.Eng. in Computer Science in Engineering Kraków, Poland | *2023 – Expected 2027*

Relevant Coursework: Statistical Data Analysis, Optimization Methods, Databases (SQL & NoSQL), Software Engineering, Algorithms and Data Structures, Object-Oriented Programming (C++)

Scientific Activity: Analytica AGH (2025 -)

- Built NLP pipeline extracting geodetic parameters from natural language input
- Designed prompt parsing and data validation workflows
- Integrated multiple LLM models for conversational user interaction, intent recognition, and structured data extraction

TECHNICAL SKILLS

Languages: Python, TypeScript, C++, SQL

Backend: FastAPI, Django, REST APIs, JWT, OAuth

Frontend: React, Next.js, Tailwind CSS

AI/ML: PyTorch, Scikit-learn, YOLO, LSTM, NLP pipelines

Data: Pandas, Polars, NumPy

Infrastructure: Docker, Linux, Git, GCP

Databases: MySQL, MongoDB

PROJECTS

Hermes AI - NLP Google Calendar Assistant: *View code*

Python application enabling natural-language control of Google Calendar using Gemini models.

- Built NLP-driven assistant translating user prompts into structured calendar operations
- Designed prompt-parsing pipeline for extracting event attributes (title, duration, reminders, color)
- Integrated Google Calendar APIs with validation layer and REST-based workflow
- Implemented create/edit/delete event automation with structured input schema
- Developed modular architecture prepared for Gmail automation extension

Tech stack: Python, Google Cloud APIs, Gemini API, REST integrations

Bee Parasite Visual Detection - Computer Vision Project *View code*

Computer vision pipeline for detecting Varroa destructor parasites on bees using YOLO-based object detection.

- Curated and labeled ~1k bee images from public datasets using Label Studio (healthy vs infected samples)
- Trained YOLOv8 object detection model achieving up to ~80% detection accuracy with confidence scoring and bounding boxes
- Built FastAPI inference service for image upload, model execution, and structured prediction output
- Implemented end-to-end workflow: dataset preparation → training → REST inference endpoint

Tech stack: Python, YOLO models, PyTorch, FastAPI, Label Studio, computer vision, dataset preparation.

RenderX *View code*

Full-stack web platform for trading graphic cards built with Django and Next.js (TypeScript)

- Designed and implemented JWT authentication with HttpOnly cookies, including secure login and registration flows
- Developed responsive customer interface with shopping cart, product listings, ratings, pricing and image handling
- Built advanced product filtering (price, brand, availability) and autocomplete search with optimized API queries
- Created protected REST API endpoints with input validation and role-based access logic
- Modeled relational MySQL schema with many-to-many relationships for products, users and orders

Tech stack: Django, Next.js, TypeScript, REST API, JWT authentication.

FEM Simulation *View code*

Engineering-focused simulation solving a transient heat conduction problem with internal heat sources using the Finite Element Method.

- *Implemented 2D FEM solver based on Fourier heat equation with Gauss-Legendre integration and Jacobian mapping*
- *Modeled copper domain with five steel volumetric heat sources and implicit time-stepping scheme*
- *Built global matrix assembly pipeline (H, C, Hbc, P) with boundary conditions and OOP mesh architecture*
- *Simulated non-stationary heat diffusion and analyzed energy accumulation using heatmaps and time-series data*

Tech stack: Python, NumPy, Matplotlib, OOP, FEM, Scientific Computing.

ADDITIONAL

- Engineering Thesis (in progress): research focused on short-term BTC price prediction and correlation analysis using advanced machine learning and deep learning methods, including LSTM-based models and time-series data processing.
- Google - *Data Analytics Professional Certificate*
- IBM - *Python for Data Science, AI & Development - course*
- IBM - *Machine Learning with Python - course*
- Cambridge English Qualification - *B2 Certificate*
- Participated in *HackYeah* hackathon as part of a 4-person team where we built a full-stack retirement simulator for ZUS.