Michał Kulczykowski

Warszawa, 03-946 | +48785697267
michal.kulczykowski@gmail.com | https://www.linkedin.com/in/michkulphd/

Seasoned Data Scientist, Machine Learning Engineer, and AI Specialist with over 10 years of extensive experience in numerical simulation, algorithm development, and advanced data analysis. Demonstrated expertise in Python, machine learning frameworks (Keras, TensorFlow, PyTorch, Scikit-learn), and GPU programming (CUDA.jl). Proven track record in developing scalable and efficient software applications, optimizing algorithms, and enhancing system performance. Skilled in deep learning, natural language processing (NLP), and computer vision with hands-on experience in deploying AI models in real-world applications. Adept at using Docker, Git, and SQL/NoSQL databases for robust software development and data management. Strong problem-solving skills with a passion for AI research and innovative technological solutions.

EXPERIENCE

Senior Researcher
Jun 2023 - May 2024

Quantumz.io, Warszawa

- Implemented algorithms for generating and converting instances into Ising/Qubo formats for benchmarking quantum computers and physics-inspired solvers, using CUDA to accelerate the process.
- Developed a comprehensive database of instances with REST API access using FastAPI and RethinkDB.
- Contributed to the development of software for airline disruption management, utilizing mixed integer programming (MIP) for schedule optimization.
- Participated in a project that applied time series analysis and MIP to optimize household energy generation and consumption, focusing on cost optimization by determining optimal times to discharge batteries and purchase power from the grid.

Postdoctoral Researcher in AI-Driven Catalysis
Apr 2022 - Nov 2023

Institute of Organic Chemistry of the Polish Academy of Sciences, Warszawa

- Built models for classifying reactions to select optimal asymmetric catalysts, utilizing MLP for classification and Random Forests for regression in predicting enantiomeric excess (ee).
- Implemented a RoBERTa model for classification, pretraining on over 2 million reactions and reaction core SMILES, and fine-tuning on 30k labeled reactions to identify suitable photocatalysts.
- Conducted extensive work on 3D structures, including molecular docking, molecular dynamics simulations, and density functional theory (DFT) calculations.

Computer Vision Programmer
Jan 2019 - Apr 2022

Avicon, Warszawa

- Developed machine vision and deep learning systems for diverse applications, implemented on both computers and embedded systems.
- Created an automated machine for color measurement using hyperspectral cameras (colorimetry).
- Designed and trained a U-Net type neural network for segmentation of lesions on chicken feet.
- Developed a model for pixel classification of shoes using hyperspectral cameras to detect shoe materials.
- Wrote software for FPGA frame grabbers using Silicon Software Visual Applets.
- Designed a system for droplet detection using Aurora Vision, subsequently porting it to C++ as a library for Python integration.

- Utilized object detection for detecting and counting worms passing through a sorting machine.
- Collaborated with various business sectors to tailor machine vision solutions to specific industry needs.

Physicist Jan 2018 - Dec 2018
Institute of Physics of the Polish Academy of Sciences, Warszawa

- Conducted research on polariton condensates, utilizing custom-written software and xmds2 to solve stochastic differential equations.
- Developed and implemented numerical simulations to investigate the behavior and properties of polariton condensates.
- Analyzed simulation data to advance understanding of non-equilibrium processes in exciton-polariton systems.

EDUCATION

Doctor of Philosophy (Ph.D.) - Physics Nov 2013 - Dec 2018
Institute of Physics of the Polish Academy of Sciences, Warszawa

Master of Engineering (M.Eng.) - Nanotechnology Oct 2011 - Feb 2013
Gdańsk University of Technology, Poland, Gdańsk

SKILLS

Expert in: Python, Numpy
Intermediate in: Pytorch, Keras, Tensorflow, C++, OpenCV, Docker, Scikit-Learn, Pandas, Git
Basic in: CUDA, Java