Tomasz Hawro

Born: February 6, 1998
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Education

- **Wrocław University of Science and Technology** — Wrocław, Poland
  Bachelor's degree - Biomedical Engineering, Medical Informatics (Grade 5.5) — *2017 - 2021*
- **Wrocław University of Science and Technology** — Wrocław, Poland
  Master's degree - Artificial Inteligence (Grade 5.5) — *2021 - 2023*

Skills Summary

- **Languages**: Python, Java, JavaScript, SQL, Android.
- **Libraries**: PyTorch, PyTorch Lightning, NumPy, Matplotlib, Optuna, scikit-learn, SciPy, plotly, OpenCV, React.
- **Tools**: ONNX, GIT, Docker, Linux, MLFlow, WandB, DVC, AutoML, Streamlit, Gradio, Hydra, Jupyter.
- **Other**: Solid knowledge of classical machine learning and neural networks algorithms.

Experience

- **BonaSoft**
  Python Developer — *Mar 2021 - Jul 2021*
  - **Backend development**: Implementation of REST API backend for a website. **Tech**: Python, Django, Swagger.
  - **Unit tests**: Implementation of unit tests for REST API calls. **Tech**: Python, Django.
- **MX Labs**
  Machine Learning Engineer — *Jul 2021 - Jul 2023*
  - **Deep Learning (DL)**: Implementation of multimodal Deep Neural Networks for blood pressure estimation (modalities: bio signals, face video, metadata). **Tech**: PyTorch, PyTorch Lightning.
  - **DL**: Implementation of lightweight CNN architectures for face metadata extraction. **Tech**: PyTorch.
  - **Productization**: Models productization from PyTorch research phase to ONNX model applicable in C++. **Tech**: PyTorch, ONNX.
  - **Research**: Versatile research on ML and DL approaches for blood pressure estimation based on PPG signals.
  - **Feature Engineering**: Implementation of feature extraction algorithms for the PPG signal. **Tech**: NumPy, SciPy.
  - **AutoML**: Optimizing ML models and preprocessing pipelines with Optuna. **Tech**: Optuna, Joblib, scikit-learn.
- **Vestigit**
  Artificial Intelligence Engineer — *Jul 2023 - Present*
  - **Research**: Versatile research on classical and DL approaches for efficient DL-based video watermarking solutions and saliency detection.
  - **DL**: Implementation and training of Convolutional Neural Networks (CNN) architectures for image segmentation, object detection and invisible real-time video watermarking.

Projects

- **Human Pose Estimation**: Implementation (from scratch) of a few Human Pose Estimation neural networks (StackedHourglass, SimpleBaseline, HRNet) and training + evaluation on MPII and COCO datasets
- **Heart Rate from face video**: Heart Rate (HR) estimation from the video of the face using PSPNet deep neural network (for skin segmentation) and DSP algorithms for further rPPG signal extraction and HR estimation
- **YOLOv1 from scratch**: Implementation and training of YOLOv1 architecture. **Tech**: Python, PyTorch, mlflow.
- **YOLOv8 Digits detection**: Handwritten digits detection using a YOLOv8 model trained on a custom dataset (demo available online). **Tech**: Python, PyTorch, PyTorch Lightning, ONNX, ONNX Runtime, React.
- **Bachelor thesis**: Categorization of auditory evoked potentials using machine learning. **Tech**: Python, scikit-learn, pandas, NumPy, SciPy.
- **Master thesis**: The influence of medical signals (ECG, EMG, EOG, PPG) representation on machine learning models results. **Tech**: Python, PyTorch, PyTorch Lightning, scikit-learn, pandas, NumPy, SciPy.
- **SqueezeNet Flowers classification**: Classification of 102 flower species using SqueezeNet architecture pretrained on ImageNet (demo available online). **Tech**: Python, PyTorch, PyTorch Lightning, Docker, Gradio.
- **GeDa**: Python package that helps to download and arrange the data for ML projects. **Tech**: Python, OpenCV.

Honors and Awards

- Winning the Dean's Award twice.
- Winning the poster session competition at *OMatKo!!!* conference - November, 2021.
- Winning the competition of IT projects of the AI Tech Summer School during the poster session - May, 2022.

Languages

- **Polish**: Native
- **English**: Proficient