



Pavol Harar, Ph.D. – Resume

Bridging Machine Learning and Artificial Intelligence with Life Science research since 2015.
Developing deep learning methods for complex time-series and 3D biomedical image analysis.
Particularly excited about ML-based simulations and generative modeling with a passion for proper engineering.

 pavol.harar.eu

Professional Biography

Machine learning research engineer with a decade of experience in deep learning, computer vision, and time-series analysis. Holds a MSc in System Engineering and Informatics and a PhD in Machine Learning from Brno University of Technology. Has expertise in high-performance multi-GPU computing, predictive modeling, signal processing, and cryo-EM/ET. With proven track record in both academic and industry settings, including post-doctoral research at the University of Vienna and the Research Institute of Molecular Pathology. Published in top journals including Cell Structure, Journal of Mathematical Imaging and Vision, Frontiers in Public Health, and Neural Computing and Applications. Co-founder of ACAI.AI and author of FakET and Redistributor.

Higher Education

09/2015 - 11/2019 PhD in Machine Learning, FEEC, Brno University of Technology, CZ
PhD thesis: Audio Classification with Deep Learning on Limited Data Sets
09/2012 - 06/2015 MSc in System Engineering and Informatics, FBM, Brno University of Technology, CZ
MSc thesis: Improved Prediction of Social Tags Using Data Mining

Work Experience

09/2024 - * **Computational Scientist for BioAI & Cryo-Electron Tomography at ISTA**
Highlights: Inventing AI/ML-based methods for cryo-EM/ET analysis, working with the ISTA supercomputer and transmission electron microscopes. Maintaining computational workflows, supporting biologically focused team members, and advancing group's computational capabilities.

01/2020 - * **Co-Founder & Freelance Machine Learning Engineer at ACAI.AI (specific projects here)**
Highlights: Delivered a visual transformer solution for automatic medical report parsing for a US healthcare startup, surpassing human performance despite having only a small training dataset by building a realistic data simulator. Developed a churn detection model for a bank, outperforming their data team by 35%. Built an image recognition system for automated claim processing for Generali Česká Pojišťovna.

04/2019 - 12/2024 **ML Research Engineer at Mathematical Data Science Group, Faculty of Mathematics, UniVie**
Highlights: Created Gabor and Mel-Scattering Python packages for audio feature extraction. Advised Austrian government on Covid-19, optimizing group-testing efficiency 10-fold. Created Redistributor, a Python library for data redistribution. Deployed Nvidia HGX 8x A100 supercomputer.

09/2015 - 12/2023 **ML Research Engineer at Brain Diseases Analysis Laboratory (BDALab), FEEC, BUT**
Highlights: Reviewed dozens and prepared a release of 4 voice pathology datasets. Established a listening group of 40+ logopedists reevaluating public voice pathology datasets. Developed RCNN model for voice pathology detection using audio signals of sustained vowel phonations.

09/2011 - 08/2014 **CEO & Co-founder of a tech startup UNITEUS Social Cloud**
Highlights: Formulated the business idea, raised capital, formed the company, assembled the team, established the company's culture, implemented Scrum, led 10+ full-time developers, released a beta version.

Invited Positions

01/2020 - 03/2024 **Visiting PostDoc at Research Institute of Molecular Pathology (IMP), Vienna, Austria**
Highlight: Created FakET, an efficient deep-learning-based simulator of transmission electron microscopes using PyTorch. Built a fully-differentiable algorithm for tomographic reconstructions in PyTorch.

10/2022 - 11/2022 **Visiting PostDoc at IDeTIC, ULPGC, Spain**
Highlight: Curated a clinical voice pathology dataset. Initiated partnerships with 4 international institutions.

04/2022 - 04/2022 **Visiting PostDoc at MINS, ETH Zürich, Switzerland**
Highlight: Conducted numerical experiments for a project on intrinsic vs. extrinsic dimensionality of data.

04/2018 - 04/2019 **Visiting PhD at NuHAG, UniVie, Austria**
Highlight: Co-authored a study on augmented loss functions in Journal of Mathematical Imaging and Vision.

01/2017 - 02/2017 **Visiting PhD at IDeTIC, ULPGC, Spain**
Highlight: Proposed a machine-learning system for automated assessment of voice pathologies.

Funding & Awards & Distinctions

2025 ISTA IPC Grant with A. Michael & A. Bronstein: Next-Generation CryoET (100 000 EUR)
2018 EU Grant Awardee: International Mobility of Researchers (65 000 EUR)
2017 Award: The best lecturer at the Department of Telecommunications, FEEC, BUT

Skills & Technical Competencies & Other

Artificial Intelligence, Machine Learning, Deep Learning, Cryo-Electron Microscopy & Tomography, Computer Vision, Signal Processing, Data Science, Research, Teaching, Keras, TensorFlow, PyTorch, OpenCV, Scipy, Scikit, Pandas, Numpy, CryoSparc, Relion, ChimeraX, HPC, Slurm, Docker, Git, Bash, Python, Linux, Teamwork, Team Leadership, Fundraising, Startups

Scientific Impact: H-index: 7; Cited by: 556; Published in and reviewed for multiple high-impact scientific journals.
Service: Organizer of Vienna Deep Learning Meetup & CryoCoffee, Ex Fundraiser & Organizer of TEDxTrenčín.
Leadership: Supervised multiple bachelor, master, and PhD students. Founded & led a startup team of 10+ developers.
Languages: Native in Slovak & Czech, English C1, German B1