Miroslav Šimko, PhD

Computer Vision / Python / C++ Developer
Currently based in Kyoto, Japan

ms@iolabs.ch
Phone: +81 70-9020-3002

Professional Summary

Results-driven Data Analyst and Machine Learning Expert with a proven track record of leveraging Python and PyTorch to extract insights from complex datasets. Proficient in the application of machine learning algorithms to solve real-world problems, with a focus on 3D computer vision and natural language processing. Experienced in developing and deploying language model-based solutions, including Large Language Models (LLMs), to enhance document understanding and classification tasks. Skilled in data visualization, statistical analysis, and model evaluation techniques.

Education

2013–2021, Ph.D., Experimental Nuclear and Particle Physics
Czech Technical University in Prague (CTU)
Faculty of Nuclear Sciences and Physical Engineering (FNSPE)
Thesis focus: Study of Heavy Flavor at the STAR Experiment

2011–2013, M.Sc., Experimental Nuclear and Particle Physics (CTU – FNSPE)
Thesis: Design and Optimization of the Optical Readout System
for Electromagnetic Calorimeter FOCAL for the ALICE Experiment

2008–2011, B.Sc., Experimental Nuclear and Particle Physics (CTU – FNSPE)
Thesis: Detector Control System for the ALICE Experiment

Experience

2021–present: ioLabs AG, Zurich, Switzerland
Computer Vision Developer (mostly remotely)
- Developed and trained 3D computer vision models for civil engineering projects.
- Led a project on sorting and understanding technical documents using LLM, embedding, and computer vision.
- Utilized advanced pruning and quantization techniques, deployed models as APIs on Flask and FastAPI.
- Proficient in Python, PyTorch framework, and state-of-the-art models such as MaskRCNN for 2D and MeshCNN for 3D computer vision.
- Developed plugins for Achicad and Vectorworx in C++.

2019–2020: ioLabs AG, Zurich, Switzerland
Geometry Engine Developer
- Engineered collision detection algorithms systems using Python and C++.

2013–2021: Brookhaven National Laboratory (BNL), USA
Experimental Physicist
- Analyzed data for heavy-flavor particle reconstruction at the STAR experiment.
- Utilized "big-data" techniques on computing clusters, employing C++ and Root.
- Applied machine learning with the TMVA package (Boosted-Decision Trees).
- Managed maintenance and upgrades for the STAR ZDC detector.

2011–2013: CERN, Switzerland: Detector Control System Expert
- Managed maintenance and upgrades for Silicon-Drift Detectors at the ALICE experiment.
- Developed upgrades in PVSS and contributed to the Prague prototype for the FoCal detector.

Languages and Skills	Czech/Slovak (native), English (fluent), Japanese (intermediate), French (beginner)
	Python, C++, PyTorch, AWS, Docker, Jenkins, Git, Statistical analysis
	Driver's License B
Interests	Physics, Automation, Photography, Sports, Reading
Publications and Conferences	Published article in Physical Review Letters, author on more than 95 collaboration papers. Presented at 9 international conferences with 3 proceedings papers.

References

Martin Loučka (current employer)
ioLabs AG
CEO
ml@iolabs.ch

Zhangbu Xu (Work on STAR ZDC)
BNL, USA
STAR Spokesperson
xzb@bnl.gov

Jaroslav Bielčík (Former supervisor)
FNSPE – CTU
Head of the Experimental Particle Physics Department
jaroslav.bielcik@fjfi.cvut.cz

Xin Dong (Supervisor at LBNL)
LBNL, USA
Senior researcher
xdong@lbl.gov

Jana Bielčíková (Former employer)
Nuclear Physics Institute, Czech Academy of Sciences
Director of the Nuclear Spectroscopy Department
jana.bielcikova@ujf.cas.cz

Vojtěch Petráček (Former supervisor)
CTU
University director
vojtech.petracek@fjfi.cvut.cz

Github page:
`https://github.com/mirsimko`

ioLabs AG
`https://iolabs.ch`