Miroslav Šimko, PhD

Computer vision / Python / C++ developer
Currently based in Kyoto, Japan

ms@iolabs.ch
Phone: +81 70-9020-3002, +420 605 063 354

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: 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: Computer-vision developer, training and development of 2D and 3D computer-vision models for engineering projects. Utilized and trained state-of-the-art models Mask RCNN and Mesh CNN. Used advanced pruning and quantization techniques. Written in Python, using the Pytorch framework, deployed as API on Flask.

2019–2020: ioLabs AG: Geometry engine for collision detection, written in C++ and Python, using Open CASCADE and VTK

2014–2021: Analysis: Reconstruction of the Λ_c baryon at the STAR experiment Brookhaven National Laboratory (BNL), USA; Collaboration between Lawrence Berkeley National Laboratory (LBNL), USA, and CTU, Czech Republic; Analysis, using "big-data" techniques on computing clusters; Code written in C++ and Root, using machine learning from the TMVA package (Boosted-Decision Trees)

2015–2019: STAR Zero-Degree-Calorimeter on-call expert at BNL, USA; Responsible for control, calibration, maintenance, and upgrades of crucial detector components; Calibration code written in C++ and Root

2013–2014: LBNL, USA: Simulations for the Pixel sensors at the STAR experiment; Written in C++ and Root

2012–2013: Development of the Prague prototype (scintillator version) of the electromagnetic-forward calorimeter FoCal for ALICE, LHC, CERN, Switzerland; R&D of optical readout; Built an automated optical testing bench; Used NIM LabView, analysis, using C++, Root, and Matlab

2011–2013: Detector-Control-System expert for the Silicon-Drift Detector for the ALICE experiment, LHC, CERN, Switzerland; Responsible for maintenance and smooth operation of the detector, written upgrades to the system in PVSS.

Languages and Skills	Czech/Slovak (native), English (fluent), Japanese (intermediate), French (beginner)
	Statistical analysis, machine learning, programming for computing clusters, Docker, Jenkins, git
	Programming in C, C++, Python, Root, Pytorch, BASH, PVSS, National Instruments LabView
	Driver's license B
Teaching	**CTU – FNSPE:** Student Physics Laboratory Practice, 2014–2019
	Supervised 3 undergraduate students
Interests	Physics, automation, photography, sport (bicycle, ski, canoeing), hiking, reading
Publications and Conferences	Analysis published in the journal Physical Review Letters
	Author on more than 95 collaboration papers
	Presented results 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`