

Miroslav Šimko, PhD

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

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Education **2013–2021, Ph.D.**, Experimental Nuclear and Particle Physics
Czech Technical University
Faculty of Nuclear Sciences and Physical Engineering
Thesis: Study of Heavy Flavor at the STAR Experiment

2011–2013, M.Sc., Experimental Nuclear and Particle Physics
Czech Technical University
Faculty of Nuclear Sciences and Physical Engineering
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
Czech Technical University
Faculty of Nuclear Sciences and Physical Engineering
Thesis: Detector Control System for the ALICE Experiment

Experience **2022–present: ioLabs AG: 3D-computer vision on meshes** Trained model
for 3D object recognition and segmentation of 3D models of buildings.
Written in Python using the Pytorch framework and Mesh-CNN model

2021–present: ioLabs AG: Computer-vision object detection on technical documents Developed object detection and automatic placement of a stamp
in documents, including automatic orientation detection. Used Pytorch
and Mask-RCNN. The model was pruned and quantized for deployment

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, USA; Collaboration between
Lawrence Berkeley National Laboratory, USA, and Czech Technical University;
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 Brookhaven
National Laboratory, USA; Responsible for calibration, checks, maintenance,
and upgrades of crucial detector components; Calibration code written
in C++ and Root

**2013–2014: Lawrence Berkeley National Laboratory, USA: Simulations
for the Pixel sensors** at the STAR experiment; Written in C++ and Root

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	<p>Czech/Slovak (native), English (fluent), Japanese (advanced intermediate), French (intermediate)</p> <p>Statistical analysis, machine learning, programming for computing clusters, Docker, Jenkins, git</p> <p>Programming in C, C++, Python, Root, Pytorch, BASH, PVSS, National Instruments LabView</p> <p>Driver's license B</p>								
Teaching	<p>Czech Technical University Faculty of Nuclear Sciences and Physical Engineering Student Physics Laboratory Practice, 2014–2019</p>								
Interests	Physics, automation, photography, sport (bicycle, ski, canoeing), hiking, reading								
Paper	J. Adam et al., “ First Measurement of Λ_c Baryon Production in Au+Au Collisions at $\sqrt{s_{NN}} = 200$ GeV ”, Phys. Rev. Lett. 124 , 172301 (2020)								
Conferences	<p>Quark Matter 2018, Venice, Italy May 13–19, 2018 Poster: Measurement of $\bar{\Lambda}_c^-/\Lambda_c^+$ ratio in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV with the STAR experiment</p> <p>3-Kings Conference 2018, Košice, Slovakia Jan 5, 2018 Talk: Measurement of open charm in relativistic-heavy-ion collisions</p> <p>19th Conference of Czech and Slovak Physicists, Prešov, Slovakia Sep 4–7, 2017 Talk: Measurement of the Λ_c baryon at $\sqrt{s_{NN}} = 200$ GeV with the STAR experiment</p> <p>EPS Conference on High Energy Physics, Venice, Italy Jul 5–12, 2017 Talk: Measurements of open charm hadron production in Au+Au collisions by the STAR experiment</p> <p>Hot Quarks, South Padre Island, Texas, USA Sep 12–17, 2016 Talk: Measurements of open charm hadrons at the STAR experiment</p> <p>Quark Matter 2015, Kobe, Japan Sep 27–Oct 3, 2015 Poster: Λ_c baryon production at $\sqrt{s_{NN}} = 200$ GeV</p> <p>ICPAQGP2015, Kolkata, India Feb 2–6, 2015 Talk: Heavy Flavor Tracker at the STAR Experiment</p> <p>18th Conference of Czech and Slovak Physicists, Olomouc, Czech Republic Sep 16–19 2014 Talk: Simulations for the HFT–Pixel detector at the STAR experiment</p> <p>Workshop VERTEX2014, Mácha Lake, Czech Republic Sep 15–19, 2014 Poster: Simulations for the HFT–Pixel detector at the STAR experiment</p>								
References	<p>Github page: https://github.com/mirsimko</p> <table> <tr> <td>Martin Loučka (current employer)</td><td>Jaroslav Bielčík (Former supervisor)</td></tr> <tr> <td>ioLabs AG</td><td>FNSPE – CTU</td></tr> <tr> <td>CEO</td><td>Head of the Experimental Particle Physics Department</td></tr> <tr> <td>ml@iolabs.ch</td><td>jaroslav.bielcik@fjfi.cvut.cz</td></tr> </table>	Martin Loučka (current employer)	Jaroslav Bielčík (Former supervisor)	ioLabs AG	FNSPE – CTU	CEO	Head of the Experimental Particle Physics Department	ml@iolabs.ch	jaroslav.bielcik@fjfi.cvut.cz
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