

Technical Skills

Experienced:

- Python • C/C++11 • Ruby • Go
- Libraries: Halide • XNNPACK • pytorch • jax • Tensorflow • pybind11 • Open3D • OpenCV • Numpy/Scipy • Matplotlib
- Development environment: Git • CMake • Bazel • Vim • Jupyter • VS Code • Visual Studio
- Other: Linux Kernel • PostgreSQL • Garmin SDK • \LaTeX

Familiar:

- Bash • Matlab • R • JS • Wolfram • Assembly • PHP
- Libraries: Cuda • Caffe • Sympy • Scikit-Learn • Pandas • NLTK • CVXPY
- Other: Windows Kernel • Mercurial • QT • SWIG • SolidWorks

Employment

Software Engineer at On-Device Performance Group



Nov 2022 — Present, Zürich,
Switzerland

- Launched gCam algorithms offloading to DSP using and enhancing Halide for the Xtena platform
- Enabled ML workloads on Qualcomm HVX DSP using XNNPACK
- Enabled XNNPACK tiling runtime with slinky

Research Intern at Mobile Vision Group



July — Oct 2021, online

- Compressed vision transformers for mobile applications
- Achieved 2x speed-up vs naive implementation

ML Intern at Special Projects Group



Apr — Aug 2020, Zürich,
Switzerland

- Launched imitation learning for enhancing autonomous agents

Research Intern



Jun 2016 — Jun 2017, Moscow,
Russia

Worked with **Prof. Andrey Ustyuzhanin** in close collaboration with CERN.

- Enabled muon tracks simulation with Generative Adversarial Networks for distributed high energy particles observatory running on commodity hardware
- Launched efficient architecture for potential hits streaming detection (50x to 30% FLOPS speedup)

Teaching

Teaching assistant of:

- **Prof. Konrad Schindler**: Image Interpretation, Fall 2017-2021 Zürich, Switzerland
- **Prof. Stamatios Lefkimmiatis**: Signal and Image Processing, Feb-Apr 2017, Moscow, Russia

Course instructor:

- Introduction to Deep Learning, May 2017, April 2021, Yerevan, Armenia
- Introduction to Scientific Computing, Fall 2018-2024 Zürich, Switzerland

Awards

2017	Awarded	Diploma with honors, Moscow Institute of Physics and Technology
2014	Awarded	Diploma with honors, Ural Federal University
2012	Finalist	Russian Student Math Olympiad

Selected Publications

- **Usvyatsov M.**, Ballester-Rippol R., Bashaeva L., Schindler K., Ferrer G., Oseledets I. T4DT: Tensorizing Time for Learning Temporal 3D Visual Data. BMVC, 2022.
- **Usvyatsov M.**, Ballester-Rippol R., Schindler K. tntorch: Tensor Network Learning with PyTorch. JMLR, 2022.
- **Usvyatsov M.**, Makarova A., Ballester-Rippol R., Rakhuba M., Krause A., Schindler K. C-Pic Gradients: Learning Low-Rank Embeddings of Visual Data via Differentiable Cross-Approximation. ICCV, 2021
- Huang S., Gojcic Z., **Usvyatsov M.**, Wieser A., Schindler K. PREDATOR: Registration of 3D Point Clouds with Low Overlap. CVPR, 2021
- Huang S., **Usvyatsov M.**, Schindler K. Indoor Scene Recognition in 3D. IROS, 2020
- Hackel T., **Usvyatsov M.**, Galliani S., Wegner J.D., Schindler K. Inference, Learning and Attention Mechanisms that Exploit and Preserve Sparsity in Convolutional Networks. IJCV, 2020
- **Usvyatsov M.**, Schindler K. Visual recognition in the wild by sampling deep similarity functions. ICRA, 2019
- Borisyak M., **Usvyatsov M.**, Mulhearn M., Shimmin C., Ustuzhanin A. Muon trigger for mobile phones. Journal of Physics: Conference Series, 2017

Summer Schools & Hackathons

Oct 2019	“Brainhack” Worked on classifying raw EEG data. Python, Pytorch.	ETHZ (Zürich, Switzerland)
Aug 2017	“Deep Bayes” Discussed Bayesian techniques in deep learning methods.	HSE - National Research University (Moscow, Russia)
Jul 2017	“Pre-doc summer school on learning systems” Discussed the basics of learning theory.	ETHZ (Zürich, Switzerland)
Jul 2016	“Mathematical methods for high-dimensional data analysis” Learned topological data analysis, sketching and streaming.	Technical University of Munich (Munich, Germany)

Education

Oct 2017 — Nov 2022	ETH Zürich	Zürich, Switzerland
• PhD in tensor algebra applications for learning on visual data		
Sep 2015 — Jul 2017	MIPT - National Research University	Moscow, Russia
• MSc in Computer Science. GPA: 4.75 / 5.0		
• Coursework: Linux Kernel Development, Windows Kernel Development		
Sep 2015 — Jun 2017	Skoltech	Moscow, Russia
• MSc in Computer Science. GPA: 4.57 / 5.0		
• Coursework: Numerical Linear Algebra, Bayesian Methods, Optimization Methods, Neural Networks, Machine Learning		
Sep 2014 — Jun 2015	Innopolis University	Kazan, Russia
• BSc in Computer Science, 2015. GPA: 4.92 / 5.0		
Sep 2010 — Jul 2014	Ural Federal University	Yekaterinburg, Russia
• BSc in Electrical Engineering, 2014. GPA: 4.96 / 5.0		

Languages

- English - Advanced • Russian - Native • German - Intermediate • Hebrew - Elementary