

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 • L^AT_EX

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 Xtensa platform
- Enabled ML workloads on Qualcom 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. Stamatis Lefkimiatis**: 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

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| 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-Ripoll R., Rakuba 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