Vlasov Roman

22.09.1991, Saint-Petersburg → Moscow

Microelectronics and sensorics → Software, FPGA → ML, optimization

☎ Contact information

`phone` +7 906 268 00 79
`e-mail` spbroma@gmail.com
`telegram` @spbroma

`linkedin` http://linkedin.com/in/roman-vlasov-69b32b69
`github` https://github.com/spbroma
`gitlab` https://gitlab.com/spbroma

💡 Interests

Research of machine learning algorithms and solving applied problems with them.

Directions, which I'm interested in for the future: image and video processing and generation, AR/VR/XR, ML for 3D, application of geometrical methods and topology

👨‍🏫 Speeches and Publications

Presentation: ODS.AI DataFest: ML Perf, Machine Learning Hardware Benchmark (2020)

Workshop: Summer school "Modern methods of information theory, optimization and control", "Application of global and gradient-based neural architecture search approaches for nonlinear digital signal processing" (2020, 2021)

Paper: Non-convex optimization in digital pre-distortion of the signal (arXiv)

💻 Working experience

Huawei Russian Research Institute, Moscow

Senior Research Engineer
Apr 2017 — ongoing

✨ General task

Adaptive models in digital signal processing (**DSP**) domain for **system recognition** task of radio-frequency signal.

🔬 Research

- Optimization algorithms for complex-valued adaptive nonlinear dynamic system: gradient, second-order, non-gradient methods
- Online structure optimization
- Evolutionary model architecture search, DARTS and other approaches

🛠 Development

- Custom framework for automatic differentiation with complex-valued signal and parameters (support and improvement, implementation of new adaptation methods)
- Flexible framework for multiple simulation launching with automatic report generation, comparing and analyzing results
- Complex-valued models for TensorFlow and custom C++ TF-blocks

- Flexible bitwise fixpoint C++ testbench for FPGA implementation of adaptive models

🚩 Languages and tools

- Python, Matlab, PyTorch, TensorFlow, C/C++, Verilog, SystemVerilog
- Git, SVN, Ubuntu, Xilinx Vivado

📄 Keywords

`machine learning`, `non-convex optimization` , `adaptive models`, `GitLab`, `AutoML`, `Neural architecture search`, `NAS`, `DARTS`, `DSP`, `Matlab`

Special Technological Center, Saint-Petersburg

Software Engineer
Jul 2014 — Jan 2017

✨ General task

Development solutions for efficiency cryptography processing

🔬 Research

- Distributed high performance computing (FPGA, GPU)
- Cryptography
- Reverse engineering of ASIC

🛠️ Development

- Timing and resource optimization of RTL
- Participation in development of devices for HPC, systems for receiving and processing of RF-signal
- Software development for Windows (Qt, Visual Studio)
- Custom FPGA IP-cores for I2C, SPI, UDP

🚩 Languages and tools

- C/C++, Verilog, Qt
- Xilinx Vivado, MS Visual Studio, Wireshark

📄 Keywords

`DSP`, `FPGA`, `software`, `hardware`, `wireless`, `cryptography`

Center of Microtechnologies and Diagnostics, LETI, SPb

Engineer
Feb 2013 — Jun 2014

✨ General task

Work on master thesis: research in algorithms of signal processing for optical sensors, implementation it in hardware and software, other support tasks

🔬 Research

- Methods of stress measurement for thin-film membranes for MEMS
- Fiber-optics and acoustic sensors
- MEMS sensors
- Increasing dynamic range of interferometric fiber-optic sensor

🛠️ Development

- Windows software (Qt, matlab, LabVIEW)
- Microcontroller firmware

- RTL design

Languages and tools

- C/C++, Verilog, Qt, LabVIEW, Matlab, LaTeX
- Qt Creator, Xilinx ISE, SolidWorks, IAR

Keywords

`sensors`, `signal processing`, `optics`, `hardware`, `software`, `MCU`, `FGPA`, `measurements`, `experiment planning`

Education and courses

Saint-Petersburg State Electrotechnical University "LETI" (2008-2014)
Nanotechnology and microsystem technics
Bachelor and Master of micro- and nanoelectronics

▼ Achievements

- The second place diploma in the competition of master's dissertation of SPb ETU students of 2013/2014 with work "Multiwavelength method of processing signal from interferometric fiber optics sensors"
- Report at conference "Applied Optics-2014"
- Report at military-scientific conference in 2014

Introduction to Machine learning (Coursera, 2018)

Introduction to Deep Learning (Coursera, 2019)

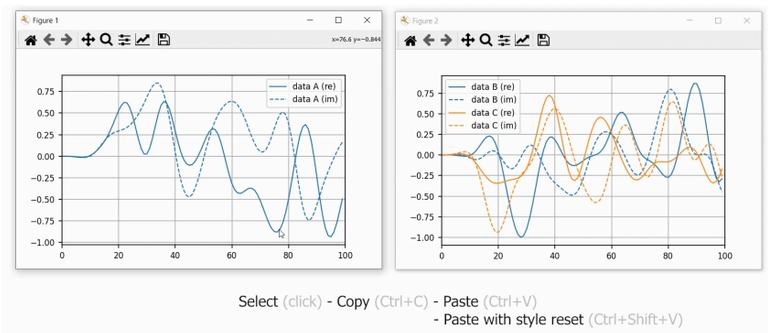
Bayesian Methods for Machine Learning (Coursera, 2020)

Pet projects

DSPlot

Python wrapper around Matplotlib and Plotly with unified interface for interactive plotting with rich opportunities. Initially, for complex-valued data with time-series, PSD and other plots.

▼ Preview



Grid map of Russia

Python interface for creating tile map visualization of Russia
More details about the whole project: https://gizh.ru/all/russian-tilemap/

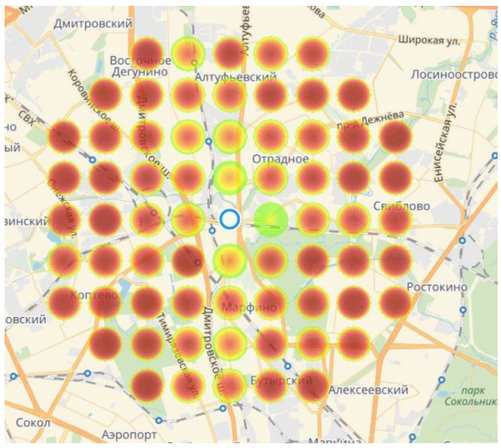
Demo

Yandex Router

After relocating to Moscow, I wanted to automate task of searching optimal area for rental flat in unknown city First criteria was public transport availability. To estimate it, I wrote a script, which uses API of Yandex.Maps, calculates time to reach points from target and visualize it.

For now page doesn't work, because of limitations and terms of use API of Yandex.Maps.

▼ Screenshot



🔄 Other interests

- 3D graphics
- Photography and graphic design
- Music