

# Sergei VOLODIN

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Route de la Chocolatière 29 A / 009, Échandens, Switzerland

Birth date: 3rd October 1994 (24 years), Russian

## EDUCATION

**Swiss Federal Institute of Technology in Lausanne (EPFL)**  
*Lausanne, Switzerland* Sep 2017 – June 2020

- Master's degree in Computer Science
- Minor in Computational Neurosciences
- GPA: **5.61/6**

**Moscow Institute of Physics and Technology**  
*Moscow, Russia* June 2017

- Bachelor's degree in Applied Mathematics
- GPA: **4.84/5**

## SKILLS

**Relevant courses:** Machine Learning, Software Engineering, Un-supervised and Reinforcement Learning, Convex Optimization, Distributed Algorithms, Algorithms, Random graph theory, Functional Programming, Set Theory, Random Processes, Functional Analysis, Biological modeling of neural networks, Complexity theory

**Scientific programming:** Keras, TensorFlow, Theano, scikit-learn, Brian 2, MATLAB, Mathematica, R

**Programming languages:** C/C++, Python, AVR C++, Scala, Java, nasm, C#

**Frameworks:** Qt/QML, Django, Android Studio, OpenGL/GLSL, Unity 3D, Blender

**Environment:** Git, L<sup>A</sup>T<sub>E</sub>X, Bash, Debian/Ubuntu Linux

**Scientific skills:** experimental sections of research papers, working on theoretical problems, scientific presentation, data analysis

**Software development:** team and project management, agile software development (Scrum), debugging, TCP/IP networking, design patterns, concurrent and distributed systems, AVR micro-controllers, Arduino platform



**Languages:** English (TOEFL iBT 112/120), French (beginner), Russian (native)

## RESEARCH EXPERIENCE

**Swiss Federal Institute of Technology in Lausanne (EPFL), Distributed Computing Laboratory** Research Assistant  
*Lausanne, Switzerland* Sep 2018 – present

- Improved the probabilistic bound on the error of a neural network in case of independent neuron failures
- Conducted experiments to test the improved theory using Keras and Tensorflow including the implementation of custom layers and regularizers


**EPFL, Computer-Human Interaction in Learning and Instruction laboratory** Research Assistant  
*Lausanne, Switzerland* Sep 2017 – Aug 2018


- Created  a library QML-AR for seamless augmented reality using OpenCV with competitive performance on Android and small visual negative impact
  - Designed an activity for kids for learning math using AR, tested the application in a classroom setting, analyzed the obtained data
- Skolkovo Institute of Science and Technology, Center for Energy Systems** Research Intern  
*Moscow, Russia* Sep 2016 – Jul 2017
- Characterized using numerical optimization and theoretically the structure of the set of boundary non-convexities of an image of a quadratic map in case the number of non-convexities is infinite
  - Designed and implemented  the Convexity Analysis of Quadratic Maps library which gives approximate solutions to a number of problems involving quadratic maps


## RESEARCH INTERESTS

Artificial Intelligence, Machine Learning, Artificial Intelligence Safety, Mathematical Optimization, Robotics


## PUBLICATIONS

A. Dymarsky, E. Gryazina, **S. Volodin**, B. Polyak.  Geometry of quadratic maps via convex relaxation. arXiv:1810.00896, 2018. Experimental section, theoretical derivations, editing

**S. Volodin**, M. Popova, V. Strijov  Probabilistic prediction of nuclear receptors biological activity. Proceedings of ITaS, 2016, *in Russian*. Implemented the Probabilistic Classifier Chains algorithm using Python and tried it on the dataset

A. Petrov, **S. Volodin**  Janibekov's effect and the laws of mechanics. Doklady Akademii Nauk, 2013. Helped to create graphics for the article and provided experimental section during my first year at MIPT

## WORK EXPERIENCE

 **EscapeControl** Jul 2015 – Feb 2016  
*Own b2b startup for escape rooms, Moscow, Russia*



- Created a startup selling software and hardware for real-world escape room games which allows to speed up the construction and reduce maintenance costs
- Responsible for back-end software engineering, servers administration, sales and customer support
- Managed a team of two web developers until a successful launch of the web interface
- Sold more than twenty solutions which are currently running in different countries across the globe and provided remote support

**ITBrat** Jul 2015 – Feb 2016  
*Algorithmic trading startup, Moscow, Russia*


- Developed algorithmic trading application from initial discussion with the team to deployment and supporting
- Added low-level user-space networking to the project which allowed to decrease latency and increase profit
- Responsible for the performance of the code


## PROJECTS

**Quadcopter drone from scratch project** 2012 – 2014



- Developed  an algorithm in C++ for stabilization of a quadcopter drone from scratch using AVR microcontrollers, IMU sensors and PID regulators
- Managed the project consisting of 2-5 developers
- Conducted the analysis of launches to improve flying quality
- Results were published as a  popular science article (*in Russian*)


## SCHOLARSHIPS


 Research Scholars, a paid Research Assistant position, Swiss Federal Institute of Technology in Lausanne (EPFL), 2017 – 2019

 Abramov Fund's scholarship for excellent grades, 2014



## CONFERENCES

 P.A.I.S.S. (AI Summer School) (INRIA Grenoble, 2018), *participant of the practical sections given by top experts;  selected to receive financial help*

 DeepBayes school on Bayesian methods in Deep Learning (Moscow, 2017), *participant of lectures and practical sessions on Bayesian Methods*

 Information Technologies and Systems (Saint-Petersburg, Repino, 2016), *speaker, poster presenter*

## COMPETITIONS

 DeepHack.RL hackathon on Deep Reinforcement Learning for Atari games, managed the team and developed an  evolutionary algorithm with an autoencoder to solve Atari games, MIPT, Moscow, Russia, 2017

## INTERESTS

Effective Altruism, Philosophy, Running (1/2 marathon 2018), Snowboarding, Swimming

## VOLUNTEERING

**Anti-corruption foundation** 2017  
*A non-profit aimed at investigating corruption, Moscow, Russia*

Conveyed the results of the investigations by talking to people on the streets as a volunteer