

EDUCATION

Master of Science	<u>Moscow Institute of Physics and Technology</u>	September 2019 — July 2021 (expected)
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- M.Sc. in Computer Science and Physics, Department of Innovation and High Technologies
- Applied Mathematics and Physics

<u>Bachelor of Science</u>	<u>Moscow Institute of Physics and Technology</u>	September 2014 — July 2019
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- B.Sc. in Computer Science and Physics, Department of Innovation and High Technologies
- Coursework for the state qualification exam in Physics at MIPT: "Molecular Dynamics" [Code]
- Intermediate Coursework: "Advanced Parser for Biomedical Texts" [Poster at MCCMB'17]
- Undergraduate Coursework: "Development of a mechanism for anomaly detection" [Presentation] [Code]

EXPERIENCE

Quantum Software Engineer Intern	<u>QuTech</u>	September 2019 — Present Delft, Netherlands
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- Delft University of Technology.
- Professor Stephanie Wehner Group, development of Quantum Internet.
- Participated in development of an embedded firmware for Hercules LaunchPad microcontroller platform to control quantum physical setup via connected ADwin-Pro (to implement Physical Layer as described in "A Link Layer Protocol for Quantum Networks").
- Participated in organization of Quantum Internet Hackathon which was held in six nodes across Europe: Delft, Dublin, Geneva, Padua, Paris or Sarajevo. Repository.
- Developed a Reinforcement Learning based system to control setup of lasers during the experiments with NV-center in diamonds.

Machine Learning Researcher	<u>Laboratory for Digital Business</u>	March 2019 — Present Moscow, Russia (remotely)
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- Responsible for research on Anomalies and Outliers Detection.
- Found and fixed a bug concerning model based on Generative Adversarial Active Learning (GAAL) in PyOD toolkit for outlier detection.
- Developed a system for anomaly detection. Used Flask and SQLAlchemy frameworks.

ML Engineer Intern	<u>3-shake</u>	August — September 2019 Tokyo, Japan (remotely)
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- R&D audience extension.

Machine Learning Researcher	<u>OCRV</u>	July — August 2019 Sochi, Russia
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- Laboratory of Artificial Intelligence and Neural Networks.
- Employee Turnover Prediction. EDA and implementation of ML systems in different fields of interest of Russian Railways.
- Responsible for Natural Language Processing, processing of legal documents.

Machine Learning Researcher	<u>ChatFirst</u>	September 2018 — April 2019 Moscow, Russia
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- Implementing different deep learning models to improve performance of chatbots, reading papers on related topics.
- Responsible for Natural Language Processing.
- Used BERT model to improve performance of production system in multiple aspects. Fine-tuned the model for downstream tasks.

- Responsible for Quantum Computing, Machine Learning.
- Developed a series of seminars concerning Quantum Computing. They include jupyter notebooks with basics of linear algebra, quantum mechanics and also work with QISKit (IBM), pyQuil (Rigetti) and Q# (Microsoft) was demonstrated.
- Supervised research student's bachelor degree diploma "Precision-Guaranteed Single-Qubit Process Tomography".
- Became a member of IBM Qiskit on GitHub.
- "Revealing quantum chaos with machine learning" — arXiv preprint.

Teaching Assistant**Laboratory of Neural Networks
and Deep Learning****March — December 2017**

Moscow, Russia

- Responsible for preparing practical and theoretical assignments for the course of Reinforcement Learning and theoretical assignments for the course of Natural Language Processing with the number of 100+ enrolled students each.

Research Assistant**Laboratory of Functional
analysis of the Genome****June 2016 — December 2017**

Moscow, Russia

- Research on protein function analysis.
- Text mining, Natural language processing, Keyword extraction, Machine learning algorithms. As an intermediate result the new method of keywords extraction using Information Theory proposed (ResearchGate).
- Participated in development of NLP package SciLK which was designed specifically for text-mining in natural sciences like biology and chemistry.

Data Scientist Intern**Sberbank-Technology****August — October 2017**

Moscow, Russia

- Responsible for Natural Language Processing projects.
- Participated in preparing the datasets and building baselines for competition Sberbank Data Science Journey which is based on SQuAD.
- Developed an analogue of Amazon Mechanical Turk to improve experience of colleagues who evaluated the quality of collected datasets (Python, Flask).

ML Engineer Intern**HiQE Group****March — June 2017**

Saint-Petersburg, Russia (remotely)

- Negotiated with IBM engineers and applied some of the IBM Watson's services in tasks of signal processing.
- Audio signal processing using machine learning methods. The system of baby cry recognition was built.

TECHNICAL EXPERIENCE

Projects

- **Service for Reading** (2019). Service has a web interface and an application for Android. It helps to read texts in foreign languages and easily add unknown words to the wordlist to further studying.
- **Quantum Computing Bot** (2018). Monitoring the load of IBM Q processors from IBM Quantum Experience. Bot is already available inside QISKit workspace in Slack (soon it will be uploaded here: <https://github.com/Qiskit/qiskit-bot>). And it's available on Telegram: <https://t.me/QuantumComputingBot>.
- **Quantum Keypad** (2018). This keypad allows to easily compose quantum circuits of different kinds. Besides keypad itself, Quantum Keypad consists of a power bank and Raspberry Pi Zero W. As a simulator I used QISKit package for Python. Inspired by Model Q.
- **Reverse Engineering in Dispersion Engineering** (2018). With a student at EPFL we developed a project on Dispersion Engineering. Our model predicts parameters of resonator system's simulation.
- **Frontopolar** (2017). Applied Reinforcement Learning for Stock Trading. State-of-the-art results were reached. Different approaches were tested including Q-learning and Recurrent Reinforcement Learning.

Contributed to Open source

- **PyOD** - PR #108
- **QISKit** - PR #366
- **pyQuil** - PR #371
- **SimulaQron** - PR#90
- **Gensim** - fixed issue #671
- **yandexdataschool/Practical_RL** - PR #12
- **Projects on GitHub**

SKILLS

- **AI:** Machine Learning, Deep Learning, Natural Language Processing, Computer Vision, Reinforcement Learning, System Deployment
- **Programming languages:** Python, C/C++, bash, R, SQL; experienced with JavaScript, HTML and CSS
- **Python libraries:** numpy, scikit-learn, pandas; **for NLP:** NLTK, Gensim; **for Deep Learning:** PyTorch, TensorFlow; **for Quantum Computing:** QISKit, pyQuil, Q#; **for Web:** Flask; **for databases:** peewee, SQLAlchemy
- **DevOps:** containers (Docker), cloud computing (AWS, GCP), code testing, source control (git)
- **Russian:** native, **English:** fluent, **German:** basics (A2)
- Experimented with RaspberryPi and Arduino. [Projects](#)
- Founded “[MIPT Deep Learning Club](#)” to discuss and share ideas on deep learning topics. Led a few seminars on topics such as “Introduction to bayesian methods”
- Experienced with **3D modeling** (FreeCAD, Blender) and **3D printing** (Ultimaker Cura, Ender 3)

TEACHING

Programming Existing Quantum Computers

May 8, 2018

Cryptography course at [Yandex School of Data Analysis](#)

Deep Reinforcement Learning

October — December 2017

course at MIPT, based on rll.berkeley.edu/deeprlcourse/
[Practical assignments](#)

Deep Learning in Natural Language Processing

March — December 2017

course at MIPT, based on cs224n.stanford.edu
[Practical assignments](#)

PUBLICATIONS

“Revealing Quantum Chaos with Machine Learning”

February 2019

[arXiv preprint](#)

“Neural Network Quantum State Tomography”

July 30 — August 3, 2018

[Superconducting Quantum Technologies \(SQT\)](#)

Poster (based on <https://github.com/RQC-QApp/NNQST>)

“Precision-guaranteed quantum process tomography: Application to IBM Quantum Experience”

May 21 — 25, 2018

[Central European Workshop on Quantum Optics \(CEWQO\)](#)

Poster

“Generative Adversarial Networks (GANs): Engine and Applications”

August 2017

[Medium Story](#)

“Advanced Parser for Biomedical Texts”

July 27 — 30, 2017

[Moscow Conference on Computational Molecular Biology \(MCCMB\)](#)

Poster, [Thesis](#)

ADDITIONAL EDUCATION

“Quantum Computing” course at Skoltech	<u>Quantum Computing</u>	February 1 — March 16, 2018
<ul style="list-style-type: none"> • Final Project - <u>Quantum walks and Variational algorithm</u> for 3- and 4-level systems. 		
“Summer school on Bayesian Methods in Deep Learning”	<u>DeepBayes Summer School</u>	August 26 — 30, 2017
“Big Data in Bioinformatics”	<u>Bioinformatics Summer School</u>	July 31 — August 5, 2017
<ul style="list-style-type: none"> • Participated in a hackathon during the school. <u>Project</u>. 		
“Natural Language Processing” course (based on cs224d.stanford.edu)	<u>DeepHack Lab</u>	September — December 2016
<ul style="list-style-type: none"> • Accepted a proposal to become a Teaching Assistant after the end of the course. 		
“Supercomputer technologies for atomistic modelling” course	<u>Igor Morozov (IHED RAS)</u>	September — December 2015
<ul style="list-style-type: none"> • Final Project - <u>Molecular Dynamics</u> is a program written in C using OpenMP framework for parallel computing. Used <u>VMD</u> for visualisation. 		

MOOCs

- **Sequence Models** by deeplearning.ai (2019)
- **Convolutional Neural Networks** by deeplearning.ai (2019)
- **Improving Neural Networks: Hyperparameter tuning, Regularization and Optimization** by deeplearning.ai (2019)
- **Full Stack Deep Learning** (2019)
- **Neural Networks and Deep Learning** by deeplearning.ai (2019)
- **Mathematics and Python for Data Analysis** by MIPT & Yandex (2017)
- **Molecular Biology and Genetics** by Bioinformatics Institute (2016)
- **Neural Networks** by Bioinformatics Institute (2016)

HACKATHONS

EPFL, Lausanne	<u>LausHack</u>	November 16 — 17, 2019
<ul style="list-style-type: none"> • (expected) 		
CERN, Geneva	<u>Quantum Futures Hackathon</u>	October 19 — 21, 2019
<ul style="list-style-type: none"> • “QML-QEC”, <u>Presentation</u> • Developed an alternative approach for quantum error mitigation of noisy quantum hardware, inspired by variational algorithms such as <u>QVECTOR</u> • Python, Qiskit, <u>Project</u> 		
Kraftwerk Accelerator, Bremen	<u>Hackathon Bremen</u>	September 20 — 22, 2019
<ul style="list-style-type: none"> • Won in nomination <u>Best Implementation</u> • Technologies used: Arduino UNO, Fusion 360 (for 3D modeling) and Node.js (for representing values received from <u>device</u>) 		
Kasárne/Kulturpark, Košice	<u>Hack Kosice</u>	March 30 — 31, 2019
<ul style="list-style-type: none"> • <u>Efficient and Faster Care</u> challenge • Implemented <u>healthcare system</u> using Zebra wristband printer and QR code scanner to identify patients easily • Reduced the amount of time needed to register a new patient • <u>Presentation</u> 		
Aalto University, Helsinki	<u>Junction</u>	November 23 — 25, 2018

- [Applications with Bluetooth Mesh](#) challenge
 - Worked with [Zephyr RTOS](#) and [reel board](#) that has built-in Bluetooth transceiver
 - Developed simple Industrial Internet of Things (IIoT) project which demonstrates the advantage of Bluetooth Mesh network
- Tochka Kipeniya, Moscow** **[Space Apps Challenge](#)** **October 20 — 21, 2018**
- [Firefighter Bot for Telegram](#)
 - Implemented during [Space Apps 2018 Challenge](#) using data from NASA including [Active Fire Data](#) by NASA
 - Python, python-telegram-bot
 - [Presentation](#)
- Volkshotel, Amsterdam** **[Quantum Internet Hackathon](#)** **October 13 — 14, 2018**
- Worked with framework for Quantum Internet called [SimulaQron](#)
 - Contributed to the [SimulaQron project](#) on GitHub
 - [Implemented](#) quantum leader-election algorithm
- Skoltech, Moscow** **[Quantum Hackathon](#)** **May 18, 2018**
- 1st [place](#)
 - There were problems on (1) quantum process tomography and (2) solving 3-SAT problem with QAOA
 - Python, Quantum Information Toolkit (QIT)
- Aalto University, Helsinki** **[Junction](#)** **November 24 — 26, 2017**
- [LegalEngine](#) - [website/telegram chat-bot/email](#) notification system, “qqmbr” team member, challenge by [Castrén & Snellman](#)
 - Our solution makes the client-attorney interaction easier with the use of telegram chat-bot and email notifications, the attorney's work and billing more transparent to the client
 - Python, Flask library, html, css
- EPFL, Lausanne** **[LauzHack](#)** **November 11 — 12, 2017**
- 1st place in challenge by [SGS](#), “NN:Nerds” team member, [Presentation](#)
 - Solution allows quick access to the main concepts found in documents
 - Responsible for development of telegram-bot and processing documents using IBM Watson service for Natural Language Understanding. [Devpost](#)
 - Python, IBM Watson API, Telegram API
- Phystechpark, Moscow** **[mABBYIity](#)** **October 7 — 8, 2017**
- 4th place, “App in the Restaurant” iOS application, [Demo](#), [Presentation](#)
 - App allows to recognise entities from restaurant menus using smartphone's camera and translates them. ABBYY Real-Time Recognition SDK, ABBYY Lingvo API and Spoonacular API were used.
 - Python, Flask library
- Skolkovo Moscow School of Management, Moscow** **[Neurocampus](#)** **September 22 — 24, 2017**
- 2nd [place](#), [@SenseOfSpeech_bot](#) telegram-bot, [Presentation](#)
 - Solution allows to extract emotions from user's recorded speech. Also it helps to train selected emotion with samples from TED talks
 - Speech Emotion Recognition (SER) module by [Vokaturi](#) was used as a core for telegram-bot based system to help users improve speech during performances.
 - Python, Telegram API
- MIPT, Moscow** **[Bioinformatics Summer School](#)** **August 3 — 4, 2017**
- “Prediction of Experimental Metadata from Gene Expression”
 - Used Machine learning algorithms to predict phenotype by gene expression. Distinguish with high accuracy samples of male and female tissues of [Mus musculus](#) organism. Datasets from Gene Expression Omnibus were used. [Project](#)

- Text Mining, parsing the records from [PubMed](#) and [UMLS](#)
- Analysis of research trends of chemical compounds and diseases during period of 1990-2015 using parsed information from PubMed database. [Project](#)
- Python

- Used a python wrapper around the Twitter API and Topic Modeling of tweets (gensim)