

## EDUCATION

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**Master of Science**                      **Moscow Institute of Physics and Technology**                      **September 2019 — July 2021 (expected)**

- M.Sc. in Computer Science and Physics, Department of Innovation and High Technologies
- Applied Mathematics and Physics

**Bachelor of Science**                      **Moscow Institute of Physics and Technology**                      **September 2014 — July 2019**

- 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

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**Machine Learning Researcher**                      **Laboratory for Digital Business**                      **March 2019 — Present**  
Moscow, Russia (remotely)

- 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.

**Quantum Software Engineer Intern**                      **QuTech**                      **September — November 2019**  
Delft, Netherlands

- 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.

**ML Engineer Intern**                      **3-shake**                      **August — September 2019**  
Tokyo, Japan (remotely)

- R&D audience extension.
- Analysis of Japanese text data with Natural Language Processing.

**Machine Learning Researcher**                      **OCRv**                      **July — August 2019**  
Sochi, Russia

- 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**                      **ChatFirst**                      **September 2018 — April 2019**  
Moscow, Russia

- 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.

**Quantum ML Researcher**

**Russian Quantum Center**

**January 2018 — March 2019**

Moscow, Russia

- 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**

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## 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**

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## 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)

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## 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 [rl.berkeley.edu/deeprlcourse/](http://rl.berkeley.edu/deeprlcourse/)  
Practical assignments

### Deep Learning in Natural Language Processing

March — December 2017

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

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## PUBLICATIONS

### "Revealing Quantum Chaos with Machine Learning"

February 5, 2020

APS Physics, 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”**  
[Central European Workshop on Quantum Optics \(CEWQO\)](#)  
Poster

May 21 — 25, 2018

**“Generative Adversarial Networks (GANs): Engine and Applications”**  
[Medium Story](#)

August 2017

**“Advanced Parser for Biomedical Texts”**  
[Moscow Conference on Computational Molecular Biology \(MCCMB\)](#)  
Poster, [Thesis](#)

July 27 — 30, 2017

## ADDITIONAL EDUCATION

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**“Quantum Computing” course at Skoltech**      [Quantum Computing](#)      February 1 — March 16, 2018

- Final Project - [Quantum walks and Variational algorithm](#) for 3- and 4-level systems.

**“Summer school on Bayesian Methods in Deep Learning”**      [DeepBayes Summer School](#)      August 26 — 30, 2017

**“Big Data in Bioinformatics”**      [Bioinformatics Summer School](#)      July 31 — August 5, 2017

- Participated in a hackathon during the school. [Project](#).

**“Natural Language Processing” course (based on cs224d.stanford.edu)**      [DeepHack Lab](#)      September — December 2016

- Accepted a proposal to become a Teaching Assistant after the end of the course.

**“Supercomputer technologies for atomistic modelling” course**      [Igor Morozov \(IHED RAS\)](#)      September — December 2015

- Final Project - [Molecular Dynamics](#) is a program written in C using OpenMP framework for parallel computing. Used [VMD](#) for visualisation.

## MOOCs

- **AI for Medical Prognosis** by deeplearning.ai (2020)
- **AI for Medical Diagnosis** by deeplearning.ai (2020)
- **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

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**EPFL, Lausanne**      [LauzHack](#)      November 16 — 17, 2019

- Challenge by SOPHiA Genetics, “Pathogen Identification Service”
- [Project](#), [Devpost](#)
- Python, Biopython, BLAST, Voilà

**CERN, Geneva**      [Quantum Futures Hackathon](#)      October 19 — 21, 2019

- “QML-QEC”, [Presentation](#)
- Developed an alternative approach for quantum error mitigation of noisy quantum hardware, inspired by variational algorithms such as [QVECTOR](#)
- Python, Qiskit, [Project](#)

**Kraftwerk Accelerator, Bremen**

**Hackathon Bremen**

**September 20 — 22, 2019**

- Won in nomination [Best Implementation](#)
- Technologies used: Arduino UNO, Fusion 360 (for 3D modeling) and Node.js (for representing values received from [device](#))

**Kasárne/Kulturpark, Košice**

**Hack Kosice**

**March 30 — 31, 2019**

- [Efficient and Faster Care](#) challenge
- Implemented [healthcare system](#) using Zebra wristband printer and QR code scanner to identify patients easily
- Reduced the amount of time needed to register a new patient
- [Presentation](#)

**Aalto University, Helsinki**

**Junction**

**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**

- 1<sup>st</sup> [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**

**LausHack**

**November 11 — 12, 2017**

- 1<sup>st</sup> 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**

- 4<sup>th</sup> 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**

- 2<sup>nd</sup> 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](#)

**ITMO, Saint Petersburg**

**BioHack**

**March 3 — 5, 2017**

- 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

**Wanha Satama, Helsinki**

**Junction**

**November 25 — 27, 2016**

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