

# Aleksei Kalinov

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## EDUCATION

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### Skolkovo Institute of Science and Technology

2019 – 2021, GPA: 5.0/5.0

MSc in Mathematics and Computer Science, Data Science concentration

*Current research topic:* Efficient distributed numerical modelling of higher-dimensional caustics in Compton scattering on Zhores supercomputing cluster. [Python, CUDA, MPI, Numpy/Scipy]

### National Research University Higher School of Economics

2015 – 2019, GPA: 9.08/10.0

BSc in Applied Mathematics and Informatics with Honors, Machine Learning track, Minor in Physics

*Thesis:* CNN-based Post-Processing of Synthetic Objects For Data Augmentation [Python, TensorFlow]

## RESEARCH EXPERIENCE

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**Kalinov A**, Bychkov R, Ivanov A, Osinsky A, Yarotsky D. Machine Learning-Assisted PAPR Reduction in Massive MIMO. 2020. *IEEE Wireless Communications Letters*. <https://doi.org/10.1109/LWC.2020.3036909>

**Kalinov A**, Kharin V Yu, Rykovanov S G. Caustics in Non-linear Compton Scattering. 2020. Poster presented at: *IX Conference for Young Researchers “Elementary Particle Physics and Cosmology”*.

Matveev S, **Kalinov A**, Krapivsky P, Brilliantov N. Steady Oscillations in Kinetic Model of Aggregation Process with Collisional Fragmentation. 2020. Poster presented at: *33rd M. Smoluchowski Symposium on Statistical Physics*.

**Kalinov A**, Konushin A. CNN-based Post-Processing of Synthetic Objects For Data Augmentation. 2019. Poster presented at: *Travelling Seminar on Machine Learning at HSE*.

## AWARDS AND CONTRIBUTIONS

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**Alternate Captain** of Skoltech ice-hockey team. Led the team to Moscow Amateur Cup victory in 2019.

**The Ilya Segalovich Scholarship** Yandex and HSE Faculty of Computer Science Scholarship for achievements in academics and research. 2018.

**The Ilya Segalovich Scholarship** Yandex and HSE Faculty of Computer Science Scholarship for achievements in academics and research. 2017.

**CS department award** The Best Computer Science Freshmen Project. 2016.

## WORK EXPERIENCE

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### Software Engineering Intern, Google

UK (Remote), June – August 2020

Designed and launched a pipeline to perform a continuous static code analysis of 2 Million Play Store apps that helps to drive non-SDK interface restrictions. Participated in Android's Inclusive Language Fix It

Java, C++, MapReduce

<https://android-review.googlesource.com/q/author:akalinov>

### Software Engineering Intern, Google

USA, July – October 2019

Increased relevance of recommendations in the internal marketing tool by 6% by inferring missing metadata of hundreds of documents with modern DL approaches.

Go, Python, TensorFlow, SQL, App Engine

### Teaching Assistant, Higher School of Economics

Russia, October 2018 – March 2019

Reviewed problem sets, graded homework and gave recitations for Natural Language Processing course.

### Software Engineering Intern, Google

USA, June – September 2018

Designed and implemented a library to transform 3D data into format suitable for existing Street View Deep Learning models. Increased throughput of a distributed 3D rendering pipeline by 11%.

C++, OpenGL

### SWE Intern in R&D department, CGF Studio

Russia, December 2017 – May 2018

Implemented and compared several physically based skin deformation simulation models for 3D characters.

Houdini, VEX, Python

<https://tinyurl.com/muscle-deformation-drive>

### Software Engineering Intern, Google

USA, July – September 2017

Developed a classification model for the YouTube content rating system based on text and sound features. Launched the model as a real-time production microservice.

Python, TensorFlow, C++

**Teaching Assistant, Higher School of Economics***Russia, October 2016 – March 2017*

Reviewed problem sets, graded homework and gave recitation classes for Discrete Math course.

**Software Engineering Intern, Google***Switzerland, July – September 2016*

Designed experiments and implemented YouTube-scale distributed pipelines to quantify importance of graph features for YouTube language classifiers.

*C++, MapReduce, TensorFlow, SQL*

**PROJECTS**

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**”We Are Not Alone” Fragment Shader**

Designed a 3D dynamic scene and implemented it from scratch completely in a fragment shader, including raymarching engine with SDF support, procedurally generated terrain and lighting with soft-shadows.

<https://www.shadertoy.com/view/WllyDn> [*OpenGL shading language*]

**Graph Convolutional Networks Modifications**

Explored several techniques, such as truncated SVD and weight orthogonalization, that allow the construction of deep graph convolutional networks and preserve the ability of network to train effectively, by conducting experiments on DropEdge model.

**Kaggle Freesound General-Purpose Audio Tagging Challenge**

Designed a classification model to label 9400 audio samples recorded in various conditions. The final model is an ensemble of 1D and 2D ConvNets processing raw sound samples, sample statistics and MFCC features.

Top 20% out of 583 participants. [*Python, PyTorch*]

**WESPE Paper Reproduction**

Independent reproduction of WESPE algorithm to enhance with GAN style-transfer.

<https://bitbucket.org/mousebaiker/wespe> [*Python, PyTorch*]

**SCHOOLS AND COURSES**

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**Travelling Seminar on Machine Learning***May 2019*

National Research University Higher School of Economics, Voronovo, Russia

**Travelling Seminar on Machine Learning***May 2018*

National Research University Higher School of Economics, Voronovo, Russia

**Course on Gaussian Processes***May-June 2017*

National Research University Higher School of Economics, Moscow, Russia