

Daniil Emtsev

41767121733 | daniil.emtsev.ig@gmail.com | github.com/daniil-777 | demtsev.com

EDUCATION

ETH Zurich

MS in Computational Science and Engineering D-MATH

Major - **Robotics**, GPA: 5.50/6.00

- *Courses*: CS & ML courses, Algorithms and Data Structures, Optimisation, Numerical Methods

Sep 2019 – present

Zurich, Switzerland

Moscow Institute of Physics and Technology (MIPT)

BS in Computer Science and Electrical Engineering; GPA: 9.00/10.00

Major - **Data Science**, with Honors and Distinction, rank - **5/200**

- *Courses*: Electrical Engineering, Physics, Machine Learning

Aug 2015 – June 2019

Moscow, Russia

EXPERIENCE

Toyota Research Center in Europe – Research Software Engineer

April. 2021 – Now

- Master's thesis on 2D image and 3D point cloud matching, 3D geometry, and deep learning
- Achieved 2x speedup of iterations to improve neural network quality
- Implemented algorithms on point clouds and improved the accuracy of localization by 5%

Zurich, Switzerland

Computer-Assisted Drug Design, Rethink – Research Software Engineer

Feb. 2020 – Nov. 2020

- Implemented Generative network models with self-attention for de novo drug design
- Implemented natural language models and improved the synthesis quality by 30%

Zurich, Switzerland

Data Analytics in Science and Engineering – Research Intern, Skoltech&MIT

June 2019 – Aug. 2019

- Implemented new methods and algorithms in topological data analysis and ML.
- Investigated loss surface of a neural network via topological features, wrote the paper

Moscow, Russia

Institute for Information Transmission Problems – Machine Learning Engineer

Feb 2019 – Jun. 2019

- Developed a pipeline for FMRI images classification
- Improved the classification accuracy by 10%

Moscow, Russia

Amgen company – Research Intern, ETH Zurich Medical Imaging Group

July 2018 – Aug. 2018

- Implemented neural networks (GAN) for processing MRI images.
- Predicted visual effects of Alzheimer's disease

Zurich, Switzerland

PUBLICATIONS

1. Lionar, S., **Emtsev, D.**, Svilarukovic, D., Peng, S. (2020). Dynamic Plane Convolutional Occupancy Networks. *Winter Conference on Applications of Computer Vision WACV 2021*. Available: <https://arxiv.org/abs/2011.05813>
2. Barannikov S., Korotin A., Oganessian D., **Emtsev D.**, Burnaev E. Barcodes as summary of objective function's topology, *The 37th International Symposium on Computational Geometry, SOCG, 2021*. Available: <https://arxiv.org/abs/2011.05813>.
3. **Emtsev D.** Studying Alzheimer's Disease related brain deformations using Generative Adversarial Networks *Poster in Cambridge Amgen Scholars symposium* (2018). Available: [link](#)

AWARDS AND HONOURS

- Master Scholarship Program ETH Zurich *covers all necessary living and study costs* February 2019
- Singapore International Pre-Graduate Award in Bioinformatics 2019
- Abramov's Scholarship for Academic Achievements at MIPT 2016-2019
- Winner in the All-Russian Olympiad *Absolute Winner in Mathematics & Physics, 1/1000 participants* February-2013
- Winner in the international tournament *International mathematical Olympiad "The Tournament of Towns"* July-2013
- Silver Medal Award, International Olympiad in Mathematics and Physics, Belgrad July-2013

PROJECTS

Augmented Reality <i>C#, Unity</i> github.com/janwww/motion-instructor	Sep. 2020 – Dec. 2020 <i>Zurich, Switzerland</i>
<ul style="list-style-type: none">• Built HoloLens2 application for virtual dancing movements (UI, kinematics)• Implemented and visualised score similarity between body postures	
Gesture Recognition <i>Python, Tensorflow</i> github.com/daniil-777/deep-gesture	May 2020 – Aug. 2020 <i>Zurich, Switzerland</i>
<ul style="list-style-type: none">• Implemented RNN with self attention for gesture recognition• Implemented transformer network for gesture recognition	
3d vision <i>Python, Pytorch</i> github.com/daniil-777/dpco	Feb. 2020 – Sep. 2020 <i>Zurich, Switzerland</i>
<ul style="list-style-type: none">• Implemented algorithms for 3d point cloud reconstruction• Wrote a paper and published in the conference	
Fluid Simulation <i>C++, OpenMP</i> github.com/daniil-777/fluidcg	Sep. 2020 – Dec. 2019 <i>Zurich, Switzerland</i>
<ul style="list-style-type: none">• Implemented liquid simulation for computer graphics application• Achieved 1.5x speedup by optimising cash locality	
Graph Matching <i>Python, Pytorch</i> github.com/daniil-777/graph-matching	Sep. 2019 – Jan. 2020 <i>Zurich, Switzerland</i>
<ul style="list-style-type: none">• Implemented a deep learning framework for Graph Based Semantic Matching	

TEACHING

Teacher & Organiser – MIPT, International Center of education	May 2016 – April 2018 <i>Moscow, Russia</i>
<ul style="list-style-type: none">• Organised summer international school and led lectures in olympiad physics and mathematics• Led own courses in electrostatics and olympiad geometry• Wrote a book "Problems and Solutions of the Olympiads at International Schools"	

TECHNICAL SKILLS

Languages: *Experienced:* Python, C++, C, R, MATLAB *Familiar:* C#, Java

Libraries: Boost, Eigen, Libigl, OpenCV, PyTorch, TensorFlow, Scikit-Learn, Pandas, NumPy, Matplotlib

Software: Git, Unity, Visual Studio Code, Bash, Vim, Docker, Google Cloud

Parallel Programming: CUDA, OpenMP

Engineering: 3D CAD modelling (Solidworks), Electronic Design, Plate Soldering, Programming of Microcontrollers