Daniil Emtsev

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demtsev.com

EDUCATION

ETH Zurich   Sep 2019 – present
MS in Computational Science and Engineering D-MATH   *Zurich, Switzerland*
Major - **Robotics**, *GPA: 5.50/6.00*
  - *Courses*: CS & ML courses, Algorithms and Data Structures, Optimization, Numerical Methods

Moscow Institute of Physics and Technology (MIPT)   Aug 2015 – June 2019
BS in Computer Science and Electrical Engineering; *GPA: 9.00/10.00*   *Moscow, Russia*
Major - **Data Science**, with Honors and Distinction, rank - **5/200**
  - *Courses*: Electrical Engineering, Physics, Machine Learning

EXPERIENCE

Computer Vision Lab ETH Zurich & Toyota Research – Master Thesis student   April. 2021 – Now
  - Master's thesis on 2D image and 3D point cloud matching, 3D geometry, and deep learning   *Zurich, Switzerland*
  - Implemented algorithms on images and point clouds
  - Improved the accuracy of localization by 50%
  - Submitted the work to CVPR 2022

Computer-Assisted Drug Design, Rethink – R&D Software Engineering Student   Feb. 2020 – Nov. 2020
  - Implemented Generative network models with self-attention for de novo drug design   *Zurich, Switzerland*
  - Implemented natural language models and improved the synthesis quality by 30%

Data Analytics in Science and Engineering – R&D Software Engineer   June 2019 – Aug. 2019
  - Implemented new methods and algorithms in topological data analysis and ML.   *Moscow, Russia*
  - Investigated loss surface of a neural network via topological features, wrote the paper

Institute for Information Transmission Problems – Bachelor thesis student   Feb 2019 – Jun. 2019
  - Developed a pipeline for FMRI images classification   *Moscow, Russia*
  - Improved the classification accuracy by 10%

Amgen company – Research Intern, ETH Zurich Medical Imaging Group   July 2018 – Aug. 2018
  - Implemented neural networks (GAN) for processing MRI images.   *Zurich, Switzerland*
  - Predicted visual effects of Alzheimer's disease

PUBLICATIONS

1. **Emtsev D.**, Danda Pani Paudel, Vaishakh Patil, Anton Obukhov, Luc Van Gool. A Direct Registration of Images on Point Clouds *submitted to **CVPR** 2022*.

2. Lionar, S., **Emtsev, D.**, Svilarkovic, 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

3. Barannikov S., Korotin A., Oganesyan D., **Emtsev D.**, Burnaev E. Barcodes as summary of objective function's topology. Available: https://arxiv.org/abs/2011.05813.

4. **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 | *C#, Unity* | github.com/janwww/motion-instuctor   Sep. 2020 – Dec. 2020
- Built Hololens2 application for virtual dancing movements (UI, kinematics)   *Zurich, Switzerland*
- Implemented and visualised score similarity between body postures

Gesture Recognition | *Python, Tensorflow* | github.com/daniil-777/deep-gesture   May 2020 – Aug. 2020
- Implemented RNN with self-attention for gesture recognition   *Zurich, Switzerland*
- Implemented transformer network for gesture recognition

3d vision | *Python, Pytorch* | github.com/daniil-777/dpco   Feb. 2020 – Sep. 2020
- Implemented algorithms for 3d point cloud reconstruction   *Zurich, Switzerland*
- Wrote a paper and published in the conference

Fluid Simulation | *C++, OpenMP* | github.com/daniil-777/fluidcg   Sep. 2020 – Dec. 2019
- Implemented liquid simulation for computer graphics application   *Zurich, Switzerland*
- Achieved 1.5x speedup by optimizing cash locality

Graph Matching | *Python, Pytorch* | github.com/daniil-777/graph-matching   Sep. 2019 – Jan. 2020
- Implemented a deep learning framework for Graph Based Semantic Matching   *Zurich, Switzerland*

Teaching

Teacher & Organiser – MIPT, International Center of education   May 2016 – April 2018
- Organized summer international school and led lectures in olympiad physics and mathematics   *Moscow, Russia*
- 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