

Anton Egorov

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EDUCATION

- **Doctor of Philosophy (Ph.D.) in Computer Science (Robotics)** Innopolis, Russia
Innopolis University; GPA: 4.2 out of 5.0 Aug. 2020 – Jan 2022
- **Master's with Honors in Information Systems and Technology (Robotics)** Moscow, Russia
Skolkovo Institute of Science and Technology (Skoltech); GPA: 5.0 out of 5.0 Sep. 2018 – Jun. 2020
- **Bachelor's with Honors in Electronics and Nanoelectronics (Power electronics)** Cheboksary, Russia
Chuvash State University; GPA: 5.0 out of 5.0 Sep. 2014 – Jun. 2018

ADDITIONAL EDUCATION

- **Tinkoff Bank Machine Learning project school** Sochi, Russia
Machine Learning Research Student (Computer Vision team) Mar. 2021
Final Project: [Development of a Deepfake service](#) - animated image, generated from the source image/video according to the motion and facial expressions of a driving video of another person.
 - Applied the [First Order Motion Model](#) for Image Animation
 - Implemented Super-Resolution based on Efficient Sub-Pixel CNN*Stack: Python (PyTorch, OpenCV, Numpy, Matplotlib), GANs*
- **OzonMasters – Program in Data Science and Data Engineering** Remote from Innopolis, Russia
Data Science Student Sep. 2021 – Dec. 2021
Relevant Subjects: Machine learning, Numerical linear algebra, Algorithms, Python, Linux

PROFESSIONAL EXPERIENCE

- **OZON TECH** Innopolis, Russia
Middle Software Developer (Localization and Mapping (SLAM) team), Self-Driving Group Jun. 2021 – present
Area: Development of Software for Self-Driving Trucks.
 - Worked with fusion sensors techniques
 - Developed a module for LiDAR to LiDAR calibration
 - Worked on a 3D LiDAR map building
 - Analyzed data collected from sensor systems*Stack: C++ (Eigen, pcl), git, Docker, bash, Cyber RT*
- **Innopolis University** Innopolis, Russia
Engineer in SLAM and Perception teams, Autonomous Transportation Systems Lab Nov. 2020 – Jun. 2021
Area: Development of Software for Self-Driving cars.
 - Worked on a 3D LiDAR map building
 - Applied matching method for robust LiDAR odometry
 - Analyzed LiDAR data collected
 - Implemented an accurate Semantic Segmentation and 3D Object detection based on LiDAR Point Clouds
 - Worked on visual road signs tracking*Stack: C++(Eigen, pcl), Python (PyTorch, ...), CNN, ROS, Docker, bash, Cyber RT*

• Skoltech

Moscow, Russia

Graduate student in Intelligent Space Robotic Lab

Oct. 2018 – Jun. 2019

Topic: Development of electronics hardware system of two autonomous mobile robots.

- Designed a printed circuit board for control Maxon motors, dynamixel and proximity sensors
- Prepared reliable the power supply system

Adviser: Professor [Dzmitry Tsetserukou](#)

• Releematika

Cheboksary, Russia

Electrical Engineer

Jul. 2016 – Sep. 2018

Topic: Development of electronics hardware system of two autonomous mobile robots.

- Developing analog electronic microprocessor parts for protection of power lines
- Worked on development of output impulse formation circuits of definite duration of output signal for the calibration device and holding tests of the complex protection from arc faults
- Development of a device: DC control relay for complex protection of power lines
- Developing of a fiber-optic sensor for detecting a short circuit in substations

INTERNSHIPS

• SMART VIEWING

Remote from Cheboksary, Russia

R&D Intern

Aug 2020 – Nov 2020

- Incorporating camera and scene geometry into deep learning models
- Applying CNN on spherical image representation to get a panoramic semantic segmentation for 3D indoor reconstruction and modeling

Stack: Python (PyTorch, ...), CNN.

• The Robotics Institute, Carnegie Mellon University

Pittsburgh, PA, USA

Graduate Research Intern in Biorobotics Lab (SLAM team)

Aug. 2019 – Jul. 2020

Topic: Investigating a robust an orientation-invariant 3D Place Recognition methods to improve large-scale a real-world robot 3D mapping

- Developed a SphereVLAD, an orientation-invariant 3D Place Recognition (77.91% on Kitty, 89.28% on Campus and 79.06% on City) method via Spherical Harmonics in 3D LIDAR-based SLAM algorithm
- Designed a coarse-to-fine sequence matching module SeqSphereVLAD, to improve 3D place identification accuracy (99.93% on Kitty, 98.88% on Campus and 99.04% on City)
- Developed a Fast Sequence-matching Enhanced orientation-invariant 3D Place Recognition method
- Designed a PSE-Match, a Viewpoint-free Place Recognition Method with Parallel Semantic Embedding

In all experiments used average (%) of Average Recall @1 under 6 different orientation cases to evaluate place recognition accuracy

Stack: Python (tensorflow, ...), SphericalCNN.

Advisers: Professor [Howie Choset](#), Postdoc. [Peng Yin](#)

• Skoltech

Moscow, Russia

Summer Intern Student in Intelligent Space Robotic Lab

Aug. 2019 – Jul. 2020

Topic: LocoGear: Locomotion Analysis of Robotic Landing Gear for Multicopters.

- Prepared reliable and stable hardware (designed a PCB and power supply system) for legs and flying systems
- Set up and calibrate the robot
- Performed real-time simulation on a quadruped mobile robot
- Presented a [poster](#) at annual Skoltech industry day 2019

Stack: Matlab-Simulink, Altium Designer.

Advisers: Professor [Dzmitry Tsetserukou](#), Dr. [Grigoriy Yashin](#)

• Helmholtz-Zentrum Berlin für Materialien und Energie (HZB)

Berlin, Germany

Undergraduate Summer Research Intern in the Institute for Solar Fuels

Jul. 2018 – Sep. 2018

Topic: Fabricate a solar water splitting device that produces hydrogen.

- Fabricated a series of 2% Zn doped π -SnS coated with different buffer layers consisting CdS, Zn(O,S), MoS₂, or Ag₅SnS₆ of which the former two were coated with a 50nm layer of TiO₂, since electrochemically unstable
- Investigated the photoelectrochemical properties a series of π -SnS devices
- Presented a [poster](#) to committee of HZB and wrote a scientific [blog post](#) as a result of work

Stack: AA-CVD, Magnetron sputtering, XRD, PEC and SEM analysis.

Adviser: Adviser: Dr. [Ibbi Ahmed](#)

TEACHING EXPERIENCE

• Innopolis University

Innopolis, Russia

TA's at Mobile Robotics and Autonomous Driving

Fall 2020

- Taught and prepared homework assignments for students (9 senior students)
- Topic included: particle filter, linear and non-linear Kalman filters
- Conducted course's final examination

• Innopolis University

Innopolis, Russia

TA's at Introduction to Artificial Intelligence

Spring 2021

- Taught and prepared homework assignments for students (50 sophomore students)
- Topic included: Searching and Optimization, Tree Searching and logic, including basics of PROLOG as a language for answering such problems, Evolutionary Algorithms

PUBLICATIONS

- Peng Yin, Fuying Wang, **Anton Egorov**, Ji Zhang. "Fast Sequence-matching Enhanced orientation-invariant 3D Place Recognition," in *Proc. IEEE Transactions on Industrial Electronics journal (TIE)*, 2021. Accessed: Feb. 2021. [Online]. Available: doi: 10.1109/TIE.2021.3057025, <https://ieeexplore.ieee.org/abstract/document/9351776>
- Peng Yin, Ziyue Feng, Lingyun Xu, **Anton Egorov** and Bing Li. "PSE-Match: A Viewpoint-free Place Recognition Method with Parallel Semantic Embedding," in *Proc. IEEE Transactions on Intelligent Transportation Systems journal (T-ITS)*, 2021. Accessed: Aug. 2021. [Online]. Available: doi: 10.1109/TITS.2021.3102429, <https://ieeexplore.ieee.org/abstract/document/9523568>
- Peng Yin, Fuying Wang, **Anton Egorov**, Jiafan Hou, Ji Zhang, Howie Choset. "SeqSphereVLAD: Sequence Matching Enhanced Orientation-invariant Place Recognition," in *Proc. International Conference on Intelligent Robots and Systems (IROS 2020)*, Las Vegas, NV, USA, 2020. Accessed: Oct. 2020. [Online]. Available: <https://ieeexplore.ieee.org/document/9341727?denied=>
- Grigoriy A. Yashin, **Anton Egorov**, Zhanibek Darush, Nikolay Zherdev, and Dzmitry Tsetserukou. "LocoGear: Locomotion Analysis of Robotic Landing Gear for Multicopters," in *IEEE Journal on Miniaturization for Air and Space Systems (J-MASS)*, vol. 1, issue 2, pp.138-147. Accessed: Sep. 2020. [Online]. Available: doi: 10.1109/JMASS.2020.3015525, <https://ieeexplore.ieee.org/document/9163320/authors#authors>

HONORS & AWARDS

- Scholarship for Phd in Computer Science at Oregon State University, Professor [Fuxin Li](#) (USA, 2022)
- Scholarship for Phd in Computer Science at Luleå University of Tech., Professor [George Nikolakopoulos](#) (Sweden, 2020)
- Scholarship for Phd in Computer Science at Innopolis University, Professor [Alexandr Klimchik](#) (Russia, 2020-2022)
- Best Project Award in Tinkoff Bank ML project school, (Russia, 2021)
- Skoltech's academic mobility scholarship (Russia, 2019)
- 2nd place in the world robotic competitions "Eurobot OPEN" Finals (France, 2019) [Online]. Available: <https://truestory.skoltech.ru/reset>
- Winner of the National stage "Eurobot OPEN" (Russia, 2019)
- Best Design Award in Robotics course (Skoltech, 2019)

- Best Project Award in Control and Systems Engineering course (Skoltech, 2019)
- Scholarship for Master's in Robotics at Skoltech, Professor [Dzmitry Tsetserukou](#) (Russia, 2018)
- HZB 2018 Undergraduate [Fellowship](#), Dr. [Ibbi Ahmed](#) (Berlin, Germany)
- Participant of the 19th World Festival of Youth and Students (Russia, 2018)

LANGUAGE FLUENCY

- Russian(native), English(fluent – TOEFL ITP)