ALEXEY KASHAPOV

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EXPERIENCE AND INTERNSHIPS

Visiting Scholar in Computer Vision

MIT CSAIL, HCI Engineering
advisor: Prof. Stefanie Mueller

November 2019 - Present Cambridge, MA, USA

- Developed an object pose estimation method with a known digital 3D model of the object with an accuracy up to **0.5 cm**
- Implemented an algorithm for a pixel to pixel projections matching between two projectors. We expect to achieve an **accuracy up to 2 mm**
- **Paper in preparation to ACM UIST 2020 (one of the top conference in human-computer interaction**

Robotics Software Developer Intern

WareVision, Robotic startup company

June – August 2019 Moscow, Russia

- Built a **decision-making system** for an autonomous mobile platform and a UAV for warehouses stocktaking
- Implemented a **motion control algorithm** for differential drive mobile platform, which includes trajectory creation and trajectory following
- Embedded my work as **ROS nodes** in the final software part. This enabled the company to show a **live demo for fund seeking**

Robotics and CV Software Developer

Eurobot 2019, Robotic Contest with Autonomous Robots

October 2018 – June 2019 La-Roche-sur-Yon, France

- Developed a **real-time computer vision algorithm** for semantic segmentation using U-Net, OpenCV, Scikit-Image. The system helps to identify the positions of multiple objects with accuracy of **1cm** at **3 fps** speed
- Built a decision-making system for two autonomous mobile robots as **ROS nodes**
- Implemented a protocol interface between high-level Odroid XU4 and low-level STM32f4 on the high-level side

RESEARCH

Deep neural network for instance segmentation of color image using associated depth map

MIT, Mechatronics Research Laboratory
advisor: Prof. Kamal Youcef-Toumi

September 2019 - Present Cambridge, MA, USA

- Finding the best **new deep learning architecture for instance segmentation** of color image using associated depth map, based on **Mask R-CNN**. The key point is **combining features from the depth map and color image** in a network's backbone.
- Collected and annotated a dataset with the most accurate 3D camera in the world - Zivid OnePlus S
- Adapted Mask R-CNN framework from Facebook to train my model

EDUCATION

Master degree

Skolkovo Institute of Science and Technology (Skoltech)

advisor: Prof. Dzmitry Tsetserukou, co-advisor: Prof. Kamal Youcef-Toumi, MIT

expected June 2020 Moscow, Russia

- Major: Information Systems and Technologies (GPA 4.9/5.0)
- Related coursework:
  Advances in Computer Vision at MIT, Information and Coding Theory, Control Systems Engineering, Systems Engineering, Robotics

Bachelor degree

Novosibirsk State University

Aug 2014 - June 2018 Novosibirsk, Russia

- Major: Physical and Technical Informatics (GPA:4.7/5.0)
- Related coursework:
  Operating Systems, Object Oriented Programming, Network technologies, Mathematical analysis, Functional analysis, Differential equations, Probability theory and statistics, Discrete Math

SKILLS

Programming:

Python, C++, C, Java, MySQL

Tools&Frameworks:

ROS, OpenCV, PyTorch, Blender, Scikit-Image, Numpy, Django, Unix OS

HONORS & AWARDS

- Skoltech's academic mobility grant
- Eurobot Open 2019 Finals, **Runner-up**
- National stage Eurobot Open 2019, **Winner**
- Skoltech's president stipend
- Russian National contest "I am a professional" in direction of Computer Science, **Medalist**

ACTIVITIES

Team mentor in Computer Vision

Eurobot 2020, Robotic Contest with Autonomous Robots

October 2019- Present

- Helped to draft a milestone and guided how to adapt a **deep learning model - YOLOv3** to solve an object detection problem.
- Suggested data augmentation techniques which **improves accuracy of the model by 5%**