ALEXEY KASHAPOV

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EXPERIENCE AND INTERNSHIPS

Visiting student

MIT CSAIL, HCI Engineering

November 2019 - Present Cambridge, MA

- Worked on the research PhotoChromeleon with a professor Stefanie Mueller. Paper is in preparation for UIST 2020
- Proposed a solution for an object pose estimation with a known 3D model of the object with accuracy **less 1cm**
- Implementing an algorithm for a pixel to pixel projections matching between two projectors on various positions. We expect to achieve the **accuracy in 1-2 pixels**

Software Developer Intern

WareVision, Robotic startup company

June – August 2019 Moscow, Russia

- Built a decision-making system based on ROS for autonomous mobile platform and an UAV to implement warehouses stocktaking which let us to show a **live demo** for investors
- Implemented a motion control algorithm for differential drive mobile platform for ROS, which includes trajectory creating and trajectory following

Robotics 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, python. The aim was to find game objects and their coordinates in game table frame. The accuracy of the algorithm is **1cm** and speed is around **3 fps**
- Built a decision making system for two autonomous mobile robots with unexpected situation processing
- Made a protocol interaction between high-level Odroid XU4 and low-level STM32f4 on the Odroid XU4 side
- Result: **runner-up** in Finals among 40 teams, that qualified from National stage; Got the **first place** in a group stage

RESEARCH

3D Mask R-CNN. Neural network for object instance segmentation on color image and depth map

MIT, Mechatronics Research Laboratory

September 2019 - Present Cambridge, MA

- Built a new deep learning architecture for instance segmentation on color images and depth maps - 3D-Mask R-CNN, which inputs are color image and associated depth map. The key feature is combining features from depth and images by adding a new feature extractor branch to a backbone.
- Collected and annotated a dataset with the most accurate 3D camera in the world - Zivid OnePlus S
- Trained 3D-Mask R-CNN with collected data on modified Mask R-CNN framework from Facebook. I included my own model to the model zoo and adapted training and testing scripts
- Comparing the results with Mask R-CNN

EDUCATION

Master degree

Skolkovo Institute of Science and Technology

expected June 2020 Moscow, Russia

- Major: Information Systems and Technologies (GPA 4.9/5.0)
- Related coursework:
  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:
  Mathematical analysis, Functional analysis, Differential equations, Probability theory and statistics, Discrete Math, Object Oriented Programming, Network technologies, Operating Systems

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

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 their object detection problem.
- Suggest data augmentation techniques which improve accuracy of model by 5%