Konstantin Sozykin

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EDUCATION

11/2018 – currently
Ph.D. Data Science (Machine Learning & Artificial Intelligence, Robotics)
Skoltech, Moscow, Russia
Thesis title : *Intelligent Human-Robot Interaction: Understanding and React to Human Behavior*
Advisor Dr. A. Cichocki and Co-Advisor Dr. A.H. Phan

09/2010 – 07/2015
M.Sc. System Engineering (Automatic Control)
Kazan National Research Technological University (KNRTU), Kazan, Russia
Thesis title: *Fractionating Process Control Based On Seimens Simatic S7-400*
GPA : 4.6/5

10/2015 – 07/2017
B.Sc. Computer Science and Engineering
Innopolis Univeristy, Kazan, Russia
Thesis title: *Multi-label Class-imbalanced Action Recognition in Hockey Videos via 3D Convolutional Neural Networks*
GPA : 4.6/5

PROFESSIONAL EXPERIENCE

2018/10 – currently
Center for Computational and Data-Intensive Science and Engineering, Skoltech, Moscow
Research Assistant / PhD student. Currently, conducting research on the following topics using advanced deep learning and tensor based methods:

- *Multi-modal Action Recognition*
- *Intelligent Human–Robot Interaction*
- *Neural Network Model Compression and Acceleration*

Guiding several masters students for research in robotics and machine learning. Also, worked on speaker recognition / anti-spoofing problem both using classical (i-vector) and neural approaches.

2018/10 – 2018/12
Teaching Assistant at a course *"Efficient Algorithms and Data Structures"*, preparing assignments and exercises and managing automatic code testing system for more than **120** master students

2018/03 – 2018/11
Center for Technologies in Robotics and Mechatronics, Innopolis University
Robotics Research Engineer. Conducted research and development on perception and navigation for Autonomous Vehicles. Developed road-lane deep-learning based semantic segmentation and navigation cost-map estimation algorithms with its integration to model predicative control method using ROS. In this project algorithms were tested both in simulator environment as well as using real vehicle KIA Soul EV. Average inference time is **44.7** ms for the whole pipeline.

2016/11 – 2018/11
RoadAR.ai, Kazan
Computer Vision Software Engineer. Deep learning and Computer Vision for ADAS. Developed and validated deep learning methods for traffic scene understanding/ADAS, improved quality of prediction in contrast with existed methods. Collaborated with other team members to integrate model for inference in mobile and embedded platforms.

2015/10 – 2017/06
Institute of Robotics, Innopolis University, Kazan
Research Intern. Worked on action recognition in hockey videos, proposed a novel approach for multi-label activity recognition in hockey sport videos based on 3D convolutional neural networks, achieved F_1 score in range **0.86-95** for major classes, such as **Play**,**Face-off** etc. See publications section for further details.

ACTIVITIES

Reviewing	IEEE Intelligent Transportation Systems Conference (ITSC), International Conference on Machine Vision (ICMV), IEEE Access (Q1-journal)
Summer Schools	Deep Learning and Bayesian Methods 2018 (*with travel grant*)

RESEARCH INTERESTS

Machine Learning	Deep Learning, Action Recognition, Speaker Identification, DNN compression and acceleration on mobile and embedded devices
Signal Processing	Image processing, Audio Processing, Source Separation
Numerical Methods	Applications of Matrix and Tensor Decompositions
Robotics	Cognitive Robotics, Human-Robot Interaction, Autonomous Vehicles

PROFESSIONAL SKILLS

Software Engineering	5+ years of programming experience in Python. Experience with software engineering tools and Linux environment (Docker, Git, CMake, Bash, etc.). Basic knowledge of Java, JavaScript, Matlab, C++ and IEC 6-1131/3
Tools & Libraries	Tensorflow, Keras, Pytorch, Librosa, Bob, Kaldi, Sklearn, ROS, OpenCV, Numpy, Scipy
Hardware & Robotic Platforms	NVIDIA Jetson, Softbank NAO v6, Microsoft kinect v2, Intel Realsense
Languages	Russian (Native), English (Fluent)

PUBLICATIONS

Journal Articles

1. Anh-Huy Phan, Konstantin Sobolev, Salman Ahmadi Asl, Igor Vorona, **Konstantin Sozykin**, Leyla Mirvakhabova, Julia Gusak , Ivan Oseledets, Andrzej Cichocki. (2019). Toward light and fast deep neural networks: non-convex optimization approaches for tensor approximations. *To be submitted*.

2. Stanislav Protasov, Adil Khan, **Konstantin Sozykin** and Muhammad Ahmad. (2018). Using deep features for video scene detection and annotation. *Signal, Image and Video Processing*. https://link.springer.com/article/10.1007/s11760-018-1244-6

Conference Proceedings

1. Buyval, A., Gabdullin, A., Sozykin, K., & Klimchik, A. (2019, October). Model predictive path integral control for car driving with autogenerated cost map based on prior map and camera image. In *2019 ieee intelligent transportation systems conference (itsc)* (pp. 2109–2114). doi:10.1109/ITSC.2019.8917227

2. **K. Sozykin**, Protasov, S., Khan, A., Hussain, R., & Lee, J. (2018, June). Multi-label class-imbalanced action recognition in hockey videos via 3d convolutional neural networks. In *2018 19th ieee/acis international conference on software engineering, artificial intelligence, networking and parallel/distributed computing (snpd)* (pp. 146–151). doi:10.1109/SNPD.2018.8441034