DENIS UZHVA

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GitHub: https://github.com/denisuzhva

PROFILE

Highly motivated software engineering student at Saint Petersburg State University. I have over a year of experience in machine learning applied to data analysis in the NA61/SHINE CERN experiment. During that period, I not only developed programming skills, but also gained experience in working with various software frameworks and APIs such as TensorFlow, NVIDIA CUDA or OpenCV, as well as strong background in applied mathematics: statistics, dynamics and theory of computation. Now my interests also encompass multiagent technology (swarm robotics, IoT), stochastic programming (compressed sensing), creative coding and corresponding hardware and software.

CORE SKILLS

- Programming languages: Python, MATLAB, R, C++, Java
- Frameworks and APIs: TensorFlow, NVIDIA CUDA, Keras, Scikit-learn, JADE, OpenCV
- Data visualization: Matplotlib, NetworkX
- Mathematics: Statistics, Dynamics, Theory of Computation
- Other: Git, Docker, LaTeX, Vim, Bash

EDUCATION

St. Petersburg State University, Saint Petersburg *September 2019 - June 2021*
M.Sc. in Software Engineering
Department of Mathematics & Mechanics

St. Petersburg State University, Saint Petersburg *September 2015 - June 2019*
B.Sc. in High energy and elementary particles physics
Department of Physics

EXPERIENCE

Research engineer *January 2021 - Present*
Saint Petersburg State University

- Investigation of algorithms for low luminosity photography quality improvement.
- Responsible for modeling of noise for simulated data. Also responsible for algorithm implementation and deployment on GPU.
- **Key achievement:** the developed noise model adequately fits standards and is able to provide pairs of baseline-noised data samples.

Junior Researcher *October 2020 - December 2020*
Institute for Problems in Mechanical Engineering of the RAS

- Investigation of new methods to control swarm robotic systems.
- Responsible for development of mathematical theory, which is able to describe multiagent networks. Also responsible for the development of the software environment for network simulations.

- **Key achievement:** the developed theory successfully describes cluster synchronization phenomenon in networks of intelligent agents.

Research assistant *September 2019 - December 2020*
Saint Petersburg State University

- Investigation of the applicability of modern machine learning methods (convolutional neural networks) to data analysis in the NA61/SHINE CERN physical experiment.
- Responsible for design of architecture and software implementation of the model, as well as data preparation, augmentation and visualization.
- **Key achievement:** the developed model demonstrate superior accuracy in comparison with classical approaches such as decision trees and "cut-based analysis".

LANGUAGE SKILLS

- Russian: native
- English: proficient
- Japanese: beginner

CONFERENCES AND SUMMER SCHOOLS

Eighteenth Russian Conference on Artificial Intelligence 2020 (Moscow)
"Invariance preserving control of clusters recognized in networks of Kuramoto oscillators"

XIV Workshop on Particle Correlations and Femtoscopy 2019 (Dubna)
"Convolutional neural network for centrality in fixed target experiments"

NA61/SHINE CERN Analysis/Software/Calibration Meeting 2019 (Katowice)
"Convolutions neural nets for centrality in Be+Be"

Science And Progress 2018 (Saint Petersburg)
"Investigation of Deep Learning methods for the classification of events in the NOvA experiment"

JINR Summer Student Program 2018 (Dubna)
"Investigation of Deep Learning methods for the classification of events in the NOvA experiment"

PUBLICATIONS

- "Cluster Flows and Multiagent Technology", Mathematics, 2021
- "Invariance preserving control of clusters recognized in networks of Kuramoto oscillators", Artificial Intelligence, 2020
- "Measurements of Ξ^- and $\overline{\Xi}^+$ production in proton–proton interactions at $\sqrt{s_{NN}} = 17.3$ GeV in the NA61/SHINE experiment", European Physical Journal C, 2020
- "Convolutional neural network for centrality determination in fixed target experiments", Physics of Particles and Nuclei, 2020