
MACHINE LEARNING EXPERIENCE

- **Top 2% solution in the Featured Simulation Kaggle Competition "Lux AI"**: Ranked 19th out of 1186 teams as a solo participant. Team shmyak. Links: [Github](#); [Leaderboard](#). The solution is based on imitation and reinforcement learning off policy actor-critic algorithm.
- **Reinforcement learning algorithms implementation**. [Github](#): Custom training loops implementation for several reinforcement algorithms (TensorFlow): different versions of DQN, categorical DQN, off policy actor-critic algorithms with dueling networks, n-step update, off policy policy gradient correction and other improvements. It uses [RAY](#) to distribute calculations and [DM Reverb](#) as a data buffer. Some versions of it include sparse nets and residual convolution nets.
- **TF records pipelines preparation**: Data preparation before training using tf.data API for efficient sampling from Google Cloud Storage. See, for example, [here](#).
- **Online courses**: [Deep Learning specialization](#), [Machine Learning](#), [Bayesian Statistics](#).

OTHER NUMERICAL EXPERIENCE

- **Helmholtz-Zentrum in Geesthacht** Geesthacht, Germany
PhD student 2017 - 2020
 - **Numerical studies**:
 1. A modeling study of the Wadden Sea biogeochemistry.
 2. A modeling study about controlling factors of the atmosphere - seawater carbon dioxide exchange in the area of the North Sea, in a Jupyter notebooks format. Both studies are computational heavy and based on biogeochemical models implemented in Python 3 and FORTRAN 2003.
 - **Optimization (learning) study**: Building and optimization of biogeochemical models. See, for example, [here](#).
 - **Data analysis**: Visualization and processing of oceanographic data from the North Sea using Pandas, Matplotlib, etc. See, for example, [here](#).
- **Institute of Oceanology** Moscow, Russia
Research engineer, researcher 2009 - 2017
 - **Numerical studies**:
 1. Participation in development of a biogeochemical oceanic model. Responsibilities: Add a computationally efficient pH calculation; migrate from FORTRAN 90 to FORTRAN 2003; migrate from Visual Studio solutions to CMake; add Linux support.
 2. Sympagic-Pelagic-Benthic-Model development. [A 1-dimensional biogeochemical tracers transport model](#). The model solves numerically a system of 1-D transport equations in Cartesian coordinates for three domains (ice, water column, and sediments) in the ocean. It is implemented in FORTRAN 2003.
 - **Signal processing study**: Waves Groupiness in the Baltic Sea study. The [study](#) uses cluster analysis to categorize waves to groups and then uses Fourier and Wavelet analysis to study properties and features of these groups.

PROGRAMMING SKILLS

- **Languages**: Python (Tensorflow, Keras, Numpy), FORTRAN, LaTeX

RECENT PUBLICATIONS

- Yakubov, S.; Protsenko, E. Alkalinity Generation in the Coastal Area, the Case of the Wadden Sea. Preprints 2021, 2021020036 ([doi:10.20944/preprints202102.0036.v1](https://doi.org/10.20944/preprints202102.0036.v1))
- Yakushev, E.V.; Wallhead, P.; Renaud, P.E.; Ilinskaya, A.; Protsenko, E.; Yakubov, S.; Pakhomova, S.; Sweetman, A.K.; Dunlop, K.; Berezina, A.; Bellerby, R.G.J.; Dale, T. Understanding the Biogeochemical Impacts of Fish Farms Using a Benthic-Pelagic Model. Water 2020, 12, 2384. ([doi:10.3390/w12092384](https://doi.org/10.3390/w12092384))
- Yakubov, S.; Wallhead, P.; Protsenko, E.; Yakushev, E.; Pakhomova, S.; Brix, H. A 1-Dimensional Sympagic-Pelagic-Benthic Transport Model (SPBM): Coupled Simulation of Ice, Water Column, and Sediment Biogeochemistry, Suitable for Arctic Applications. Water 2019, 11, 1582. ([doi:10.3390/w11081582](https://doi.org/10.3390/w11081582))

EDUCATION

- **Moscow State University** Moscow, Russia
Specialist, Oceanography 2003 - 2008