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Machine Learning experience

- **TF2 reinforcement testcases** development: Python 3 TensorFlow 2 reinforcement algorithms implementation: 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 convolutional nets.

- **Kaggle Geese competition Gym environment wrapper** development: A Gym wrapper around Kaggle Geese environment to sample experience efficiently with several reward systems and observation representations to use with the TF2 reinforcement testcases.

- **TF records pipelines preparation**: Data preparation before training using tf.data API for efficient sampling from Google Cloud Storage. See, for example, here.

- **Custom neural nets development**: Residual Convolutional nets, sparse nets using Keras and TensorFlow 2. See, for example, here.

- **Online courses**: Deep Learning specialization, Machine Learning, Bayesian Statistics.

Other experience

- **Helmholtz-Zentrum in Geesthacht** — Geesthacht, Germany
  PhD student — *2017 - 2020*
  - **Research**: Study 1. A modeling study of the Wadden Sea biogeochemistry features. There are several Jupyter notebooks, which describe methods for easy reproduction. Study 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.
  - **Biogeochemical and marine ecosystem models development**: 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
  Junior Researcher — *2013 - 2017*
  - **Participation in development of BottomRedOxModel**: Responsibilities: Add a computationally efficient pH calculation; migrate from FORTRAN 90 to FORTRAN 2003; migrate from Visual Studio solutions to CMake; add Linux support.
  - **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. The dynamics include diffusion and advection part. It is implemented in FORTRAN 2003.
  - **Waves Groupiness in the Baltic See 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.

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)

- 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)

- 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)

Education

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