



Contribution ID: 23

Type: **Presentation**

Artificial neural networks for multi-label cloud types classification from all-sky optical imagery over the ocean.

Thursday 7 July 2022 15:15 (15 minutes)

Cloudiness plays an important role in the hydrological cycle of the atmosphere. Cloud types and other cloud spatial and temporal characteristics provide the ability to make short-term in situ weather forecasts. With the help of clouds, one may also track the content of various impurities in the air. Most importantly, clouds are the major obstacle on the pathway of incoming solar radiation, thus, classifying cloud types may be useful for solar energy plants. In our study, we use artificial neural networks for classifying cloud types in all-sky optical imagery of the visible hemisphere of the sky. The problem is soft classification due to presence of several cloud types at once in most of images. We constructed a convolutional neural network based on SE-ResNeXt101 architecture. The DASIO (Dataset of All-Sky Imagery over the Ocean) dataset for our study is collected in Indian, Atlantic and Arctic oceans from 2014 till 2021 and contains over 1.5 million images. For the 80'000 of them, the visual observations of cloud types are provided by experienced meteorologists. Being trained with this dataset, our model achieved high performance: sample-averaged F1-score is 0.7 which is state of the art compared to contemporary studies.

Agreement to place

Participants agree to post their abstracts and presentations online at the workshop website. All materials will be placed in the form in which they were provided by the authors

Authors: VEREMEV, Nikita; KRINITSKIY, Mikhail (Shirshov Institute of Oceanology, Russian Academy of Sciences)

Presenter: VEREMEV, Nikita

Session Classification: Session 3. Machine learning in Biology and Other Natural Sciences

Track Classification: Track 3. Machine Learning in Natural Sciences