

REVIEW
on bachelor's thesis of the SpbU student
Kutukov Sergey Evgenevich
on topic Anomaly detection on Chest X-Ray

Relevance of the research topic:

The thesis is devoted to the development of a model of machine learning, which includes feature extraction and classification methods, for the search of anomalies on chest x-ray images. Today, carrying out of the chest radiography is a compulsory procedure for every person in Russia, so every year specialists have to handle a huge amount of data. In this regard, the solution of the problem of anomalies search on X-ray images, which bases on neural network technology, is relevant.

Brief description of the work structure and sections:

The thesis consists of 26 pages. The following issues are considered in the work: the review of classical and generative feature extraction methods as well as methods for dimensional reduction is performed. In addition, the thesis presents the results of evaluation of the developed model for anomalies search.

Advantages of work:

The presented final qualifying work demonstrates the thoroughness of the material, including the justification of the choice of machine learning methods. The work shows the high level of the theoretical preparation of the student and his ability to work with technical literature.

The thesis presents the auto-encoder and the generative-competitive neural network train and comparison of their work with the classic deep convolutional network ChestXNet. The experiments was carried out on NIH Chest X-ray data. The results show that the model based on ChestXNet gives the best result, rather than based on the auto-encoder.

Disadvantages of work:

The thesis presents review of the generative models of machine learning. The choice of an autoencoder and a combination of a variation autoencoder of a genetino-controversial neural network to solve the problem is not sufficiently explained. In addition, there is no justification for choosing AUR-ROC and AUR-PR metrics to evaluate the experimental data.

The conclusion about the thesis:

The thesis of Kutukov S. "Anomaly detection on Chest X-Ray" meets the basic requirements for graduation qualifications.

The reviewer's opinion on the evaluation of the work:

The thesis of Kutukov S. deserves an evaluation of "EXCELLENT", and the author is worthy of a bachelor's degree.

Ph.D., Assoc. prof.

A 16.05.19

Alexander Ronzhin

