

ABSTRACT

Explanatory note size – 109 pages, contains 23 illustrations, 38 tables, 3 applications, 38 references.

Topicality. The paper considers a problem in the field of medicine, namely, diagnosis of diseases. After analyzing the existing research on the chosen object, namely software for the classification of X-ray images, it was found that the existing solutions to the problem focus on the accuracy of diagnosing diseases. The question of improving the training time of models has not been investigated at the moment, despite the importance of this topic - adjusting model parameters to acceptable accuracy takes a long time, from several months to a year. In this regard, the need for the development of an architectural solution that will speed up the training time of models has been identified.

The aim of the study. The main target is The main goal is to improve the training time of X-ray disease diagnosis models.

The object of research: X-ray classification software.

The subject of research: the processes of development, modification, analysis, quality assurance, implementation and maintenance of software for the classification of X-ray images.

To achieve this goal, the **following tasks** were formulated:

- analysis of existing studies of methods and solutions for diagnosing diseases using X-ray images;
- analysis of existing mathematical methods of image classification and justification of the choice of classification method;
- analysis of available software libraries that implement the selected mathematical method;
- implementation of the software code that solves the task using the selected methods;
- development of a graphical interface for software demonstration;
- marketing analysis of the project;

- evaluation of the effectiveness of the proposed solution based on computational experiments.

The scientific novelty of the results of the master's dissertation is that an architectural solution for the diagnosis of diseases based on X-ray images is proposed, which reduces time spent on creating and comparing new models. The result is achieved through distributed data processing using an integrated Apache Spark and Tensorflow solution.

The practical value of the obtained results is that a highly efficient architectural solution has been developed for the creation, comparison and application of models for diagnosing several types of diseases based on the data of X-ray images of the chest. This system can be used by scientists and programmers to create, test and improve disease diagnosis models based on X-ray images.

Relationship with working with scientific programs, plans, topics. The work was performed at the Department of Informatics and Software Engineering of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" in the framework of the topic "Methods and technologies of high-performance computing and big data processing". State registration number 0117U000924.

Approbation. The scientific provisions of the dissertation were tested at the Third All-Ukrainian Scientific and Practical Conference of Young Scientists and Students "Software Engineering and Advanced Information Technologies" (SoftTech-2022 Autumn)

Publications. The scientific provisions of the dissertation were published in abstracts of the scientific and technical conference "SoftTech-2022 autumn".

Keywords: DISEASE DIAGNOSTICS, X-RAYS, DISTRIBUTED DATA PROCESSING, APACHE SPARK.