

ABSTRACT

Explanatory note size – 161 pages, contains 46 illustrations, 24 tables, 6 applications, 57 references.

Topicality. The paper addresses the problem caused by the growth in the volume of digital information, in particular scanned documents. Existing software analogues do not provide the expected desired result. To obtain a correct text that fully reflects the original document, effective tools for its processing and analysis are needed. Continuous progress in the field of machine learning and deep learning opens up new opportunities for improving the accuracy and speed of text recognition. OCR technologies allow you to automate routine tasks such as data entry, document archiving, and information search, which increases productivity, reduces costs, and saves time. There is a need to develop software for detecting and recognizing text in non-text documents using modern neural networks.

The aim of the study. The main target is to improve the accuracy of text detection and recognition in non-text documents.

The object of research: text recognition software.

The subject of research: methods, algorithms, and architecture of software for detecting and recognizing text in non-text documents aimed at improving accuracy.

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

- analyze existing solutions to identify necessary improvements accuracy of text detection and recognition in non-text format documents;
- develop a method using modern neural networks to detect and recognize text in non-text format documents;
- develop a software solution;
- research and evaluate the effectiveness of the proposed solution.

The scientific novelty of the results of the master's dissertation is that a generalized model of the OCR software system is proposed, which describes the complete image processing cycle, from preliminary preparation to post-processing of the result, and is adapted to work with different types of documents. The approach to detecting text in non-text documents has been improved by combining traditional pre-processing methods and the use of deep neural network architectures, which increases text recognition accuracy, speed, and productivity.

The practical value of the obtained results lies in the fact that the implemented and combined image processing methods, the use of two OCR engines and automatic fallback, and the PyQt5 framework are integrated within a single application with a simple user interface and native user interface. This system is useful for state-owned enterprises when working with scanned documents and images, as it will optimize routine data entry and archiving tasks, increase productivity, and save time.

Relationship with working with scientific programs, plans, topics. Work was performed at the Department of Informatics and Software Engineering of the National Technical University of Ukraine «Kyiv Polytechnic Institute. Igor Sikorsky».

Approbation. The scientific provisions of the dissertation were tested at the IX International Scientific and Practical Conference of Young Scientists and Students “Software Engineering and Advanced Information Technologies” (SoftTech-2025) - Kyiv.

Publications. The scientific provisions of the dissertation were published in:

- 1) Dyshkant L.L. Software for detecting and recognizing text in non-text format documents/ Dyshkant L.L., Kramar Y.M. // Proceedings of the IX International Scientific and Practical Conference of Young Scientists and Students “Software Engineering and Advanced Information Technologies” (SoftTech-2025) – Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, November 26-28, 2025.

Keywords: OCR, DETECTION, TEXT RECOGNITION, CRNN, IMAGE PROCESSING, NEURAL NETWORKS