

відкриває широкі можливості для подальшого розвитку, включаючи розширення асортименту товарів, вдосконалення системи зворотного зв'язку з користувачами та впровадження нових технологій для поліпшення досвіду покупців. Таким чином, цей дипломний проект не лише відображає практичні навички в розробці програмного забезпечення, але й відкриває нові перспективи для подальших досліджень у сфері інтернет-торгівлі будівельними матеріалами.

Результати даної роботи свідчать про успішну реалізацію інтернет-магазину будівельних матеріалів на платформі .NET з акцентом на його юзабіліті та функціональність. Цей проект є важливим кроком у напрямку вдосконалення інтернет-торгівлі та створення платформи, яка задовольняє потреби користувачів у зручних та ефективних способах покупок будівельних матеріалів.

PRACTICAL APPROACH FOR DETECTION BY DEEP LEARNING OF TARGET OBJECTS OF SUBJECT AREA BASED ON SEMANTIC CONNECTIVITY INDICATORS IN AUDIO DATABASE

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According to Statista, in 2023, 72% of Ukrainians aged 15 to 74 used the Internet. This indicator is constantly growing, and it is expected to reach 80% by 2025 [1].

Along with this, there is a significant increase in demand for Ukrainian-language content in the media sphere, including television, radio, online platforms and social networks. This is due to several factors, such as the increase in the share of Ukrainian-speaking Internet users, the growth of national consciousness and the desire to consume content in their native language, as well as the introduction of laws that stimulate the use of the Ukrainian language in the media.

Manual detection of actors in audio data is a laborious and time-consuming process, but automated tools based on artificial intelligence can make this work much easier and faster.

The use of artificial intelligence will allow media companies to recommend content to users that will be of interest to them and increase audience engagement and loyalty to Ukrainian-language media.

The task of identifying actors in Ukrainian-language audio data is a partial case of the Named Entity Recognition (NER) task. It is a natural language processing method that aims to identify and extract important information from text by identifying named entities. These named entities can include names of people, places, dates, organizations, and other key elements of text that consistently point to the same thing. NER essentially extracts and classifies the detected entity into a predefined category [2]. The category can be general, such as Organization, Person, Location, Time, etc., or a specific category depending on the use case, such as Healthcare Conditions, Programming Language, etc. For example, the NER model identifies «soccer» as an object in a paragraph and classifies it as a sport. Using this method allows you to automatically analyze and categorize text for further use in various fields such as machine learning, text analysis, speech recognition, and others. NER is an important tool for understanding and processing large volumes of textual information in various fields of activity [3].

The aim of the work is practical detection by deep learning of target objects of subject area based on semantic connectivity indicators in audio, and projecting of relation datalogic model for detection of target objects of subject area.

The method for detection by deep learning of target objects of subject area in audiodata based on semantic connectivity indicators is intended for automated identification and analysis of existing actors in audio files. The input of the method is an audio file for analysis. The output data is a grouped list of actors with avoidance of repetitions. The scheme and steps of the method are shown in Figure 1.

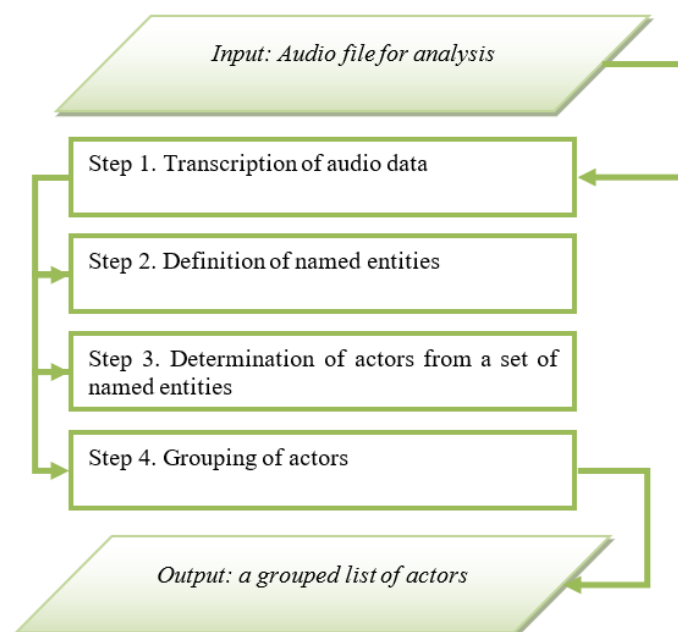


Figure 1. Scheme and steps of the method for detection by deep learning of target objects of subject area in audiodata based on semantic connectivity indicators.

The first step is to transcribe audio data, which is the conversion of speech recorded as an audio file into text form [4, 5].

The second step is to identify named entities using a neural network approach [6], which will sample all available named entities, including places, persons, dates, organizations, etc., in the textual representation of the input audio file.

The third step is to determine the actors from the set of named entities, by selecting the persons from the general list of entities found by the neural network approach.

The fourth step is the grouping of actors, for grouping of which lemmatization is applied to the general set found by the neural network method, and duplicates are crossed out.

Accordingly, the source data will already be a list of target objects of subject area without duplication.

Figure 2 shows the relation datalogic model for detection by deep learning of target objects of subject area in audio data based on semantic connectivity indicators.

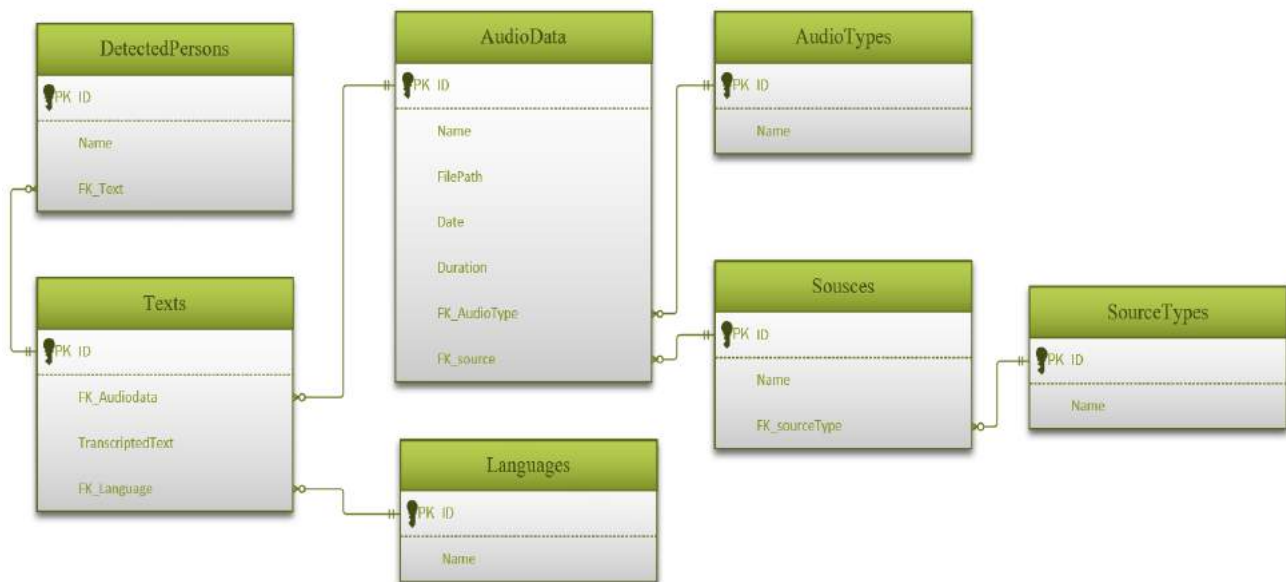


Figure 2. Relation datalogic model for detection by deep learning of target objects of subject area in audiodata based on semantic connectivity indicators.

The «DetectedPersons» table allows you to store information about the main participants of the audio data that will be identified as a result of the software application. The «AudioData» table contains basic information about audio files, which includes the name of the file, its location on the server or device, the creation date, and the duration of the recording. The «Texts» table stores the text transcribed from the audio content and consists of such attributes as: «ID», «FK_Audiodata», «TranscribedText» and «FK_Language». The «Languages» table is intended to store information about languages that can be recognized when transcribing audio content. The «AudioTypes» table contains data about the names of audio content. The «Sources» table is created to store information about the sources from which the audio content is taken. The «SourceTypes» table stores information about the types of audio content sources.

A practical approach was performed in the form of an information system for detection by deep learning of target objects of subject area based on semantic connectivity indicators in audiodata. The analysis of the functionality of the information system determines the first step of launching the software application, the main interface of which is shown in Figure 3.

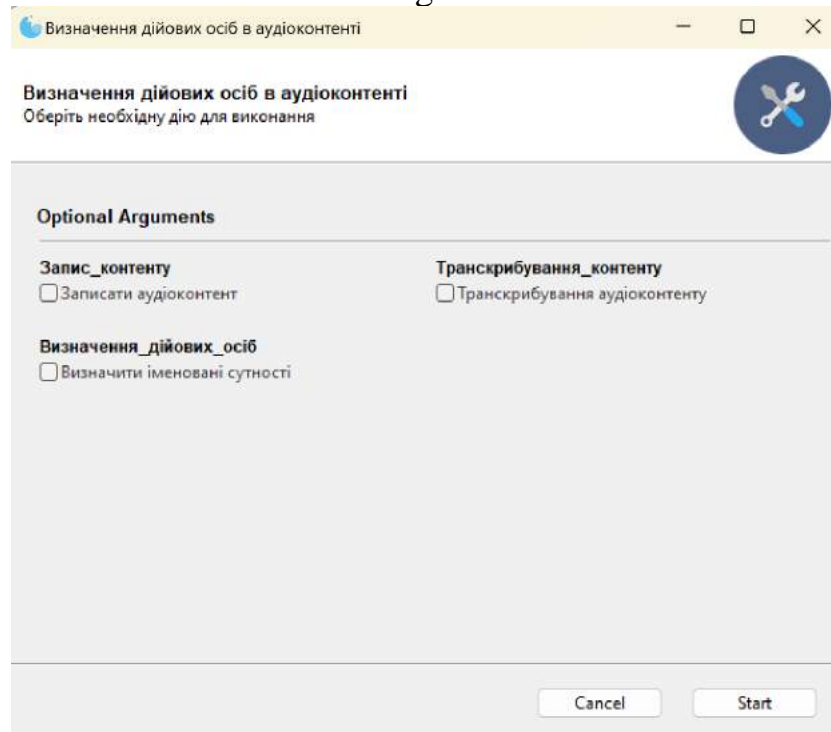


Figure 3. Interface of the main window of information system for deep learning detection of target objects of subject area based on semantic connectivity indicators in audio data.

If the user needs to perform a certain action from the proposed list, namely: record audio content, transcribe it and identify actors in the content, click the checkbox next to the corresponding action. You can execute all commands at once or one/several of them.

To record audio content, click the checkbox next to the «Record audio content» action and the «Start» button. After that, a window will open, where basic information about the operation of the program will be displayed (Figure 4).

If the software application has successfully finished processing the audio content, a confirmation will appear on the screen in the form of the message «Audio content has been recorded successfully». To continue the process of transcribing the text, the user should press the «Transcribe text» button, and then – «Start».

After that, a file explorer window will appear on the screen, where he can select the appropriate record for further transcribing. This process simplifies interaction with the software and increases user convenience, allowing you to quickly and efficiently perform the necessary tasks. The result of transcribing audio content is a saved text file and displaying the content on the screen.

To search for actors in the text, you need to activate the «Identification of actors» flag and press the «Start» button. This will allow the program to begin the process of analyzing the text to identify and identify the individuals involved in the given context.

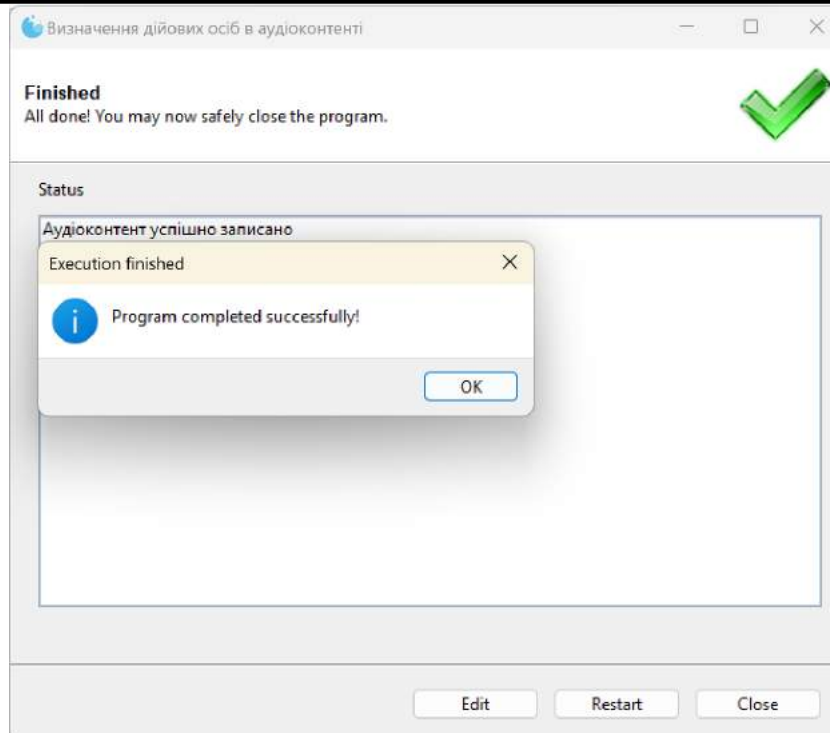


Figure 4. The window of information system for recording audio content.

When starting this operation, information about the execution of the task is provided in the corresponding field for outputting information. Figure 5 shows an example of the software application when searching for actors in the content.

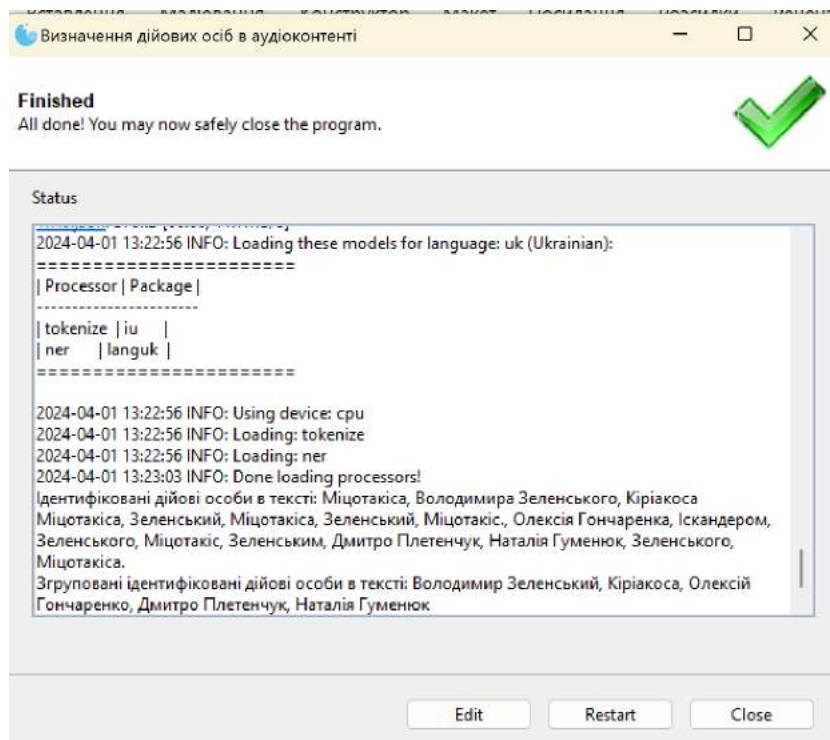


Figure 5. Search of actors in the text by information system

The software product returns the set of all identified named entities with the PERS tag and a grouped set to avoid duplicates among actors.

Thus, a practical approach for detection by deep learning of target objects of subject area based on semantic connectivity indicators in audio database was performed. A database was also created for the software that performs the detection of actors in Ukrainian-language audio data for the media sphere. This database includes the necessary tables that provide convenient storage and organization of information about actors, audio data and transcription. It is a key tool for the analysis and processing of audio data in the media field, which allows you to efficiently identify, classify and analyze the information contained in audio files, taking into account their context and content

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