Brief information about the project

Name of the project: AP22686812 "Comprehensive system for diagnosing brain stroke using artificial intelligence"

Short description of the project: Today, brain stroke is a global health problem worldwide. Diagnosing a stroke is time-consuming and hard work that requires a comprehensive approach. The development of artificial intelligence (AI) in medicine provides solutions to various problems, and stroke is no exception. Our research not only offers a modern solution capable of revising stroke diagnostic protocols but also seeks to mitigate the extensive global consequences of this serious medical ailment.

Purpose: Improve recognition, classification, and segmentation methods using deep learning and machine learning models to diagnose stroke from MRI and CT images of the brain.

Objectives: To achieve this goal, it is necessary to solve the following tasks::

1. To investigate existing methods and models of stroke diagnosis using AI
2. Collect a large amount of input MRI and CT visual data according to the classification of "brain with pathology" and "healthy brain".
3. Create algorithms for the formation of training samples and databases of MRI and CT scans with a wide range of brain pathologies.
4. Apply and create algorithms to automate experimental analyses of machine learning and deep learning models.
5. Experiment with the developed MO and GO models in the processing and analysis of visual medical data, as well as evaluate the effectiveness and accuracy using existing methods in the rapid diagnosis of brain stroke.
6. Improve the accuracy of brain stroke diagnosis by improving existing models at the initial stage.

Expected and achieved results: As a result of the project, it is planned to publish 3 articles in a peer-reviewed scientific publication in the scientific field of the project, included in the 1st (first), 2nd (second) or 3rd (third) quartile according to the Web of Science database, in scientific peer-reviewed journals in the main field of the project, indexed in the Scopus database, where the CiteScore percentile is at least more than 50 (fifty), 1 monograph, 3 publications in international or domestic journals, which were recommended by the COKNVO. To develop artificial intelligence models and their architecture to classify, segment, and determine stroke using MRI and CT visual brain data. Write a monograph as the resulting material. The developed models can be used in healthcare and healthcare, and in the future there is an opportunity to commercialize the project in B2B, B2C, and B2G areas.

Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles:

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List of publications with links to them:

1. https://recyt.fecyt.es/index.php/retos/article/download/110267/80434/446500
2. https://bulletin-phmath.kaznpu.kz/index.php/ped/article/view/2179/1038
3. https://doi.org/10.54309/IJICT.2025.21.1.010