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(центр навчання студентів іноземною мовою)
(повна назва)

Кафедра Біомедичної інженерії
(повна назва)

АНОТАЦІЯ
кваліфікаційної роботи

рівень вищої освіти другий (магістерський)

Метод аналізу томографічних зображень грудної клітини пацієнтів з пневмонією
(тема)

Виконав:
студент 6курсу, групи БМІім-19-1
Ханнаві Алі
(прізвище, ініціали)
Спеціальність 163 Біомедична інженерія
(код і повна назва спеціальності)
Освітня програма Біомедична інженерія
(повна назва освітньої програми)
Керівник доцент Лінник О.В.
(посада, прізвище, ініціали)

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ВСТУП

Computerized Tomography (CT) is a medical imaging method that processes large amounts of two-dimensional X-ray images in order to produce a three-dimensional image.

Typically, the X-ray images represent ‘‘slices’’ of the part of the body (such as the brain) that is examined. Those slices are indirectly obtained via axial measurements of X-ray attenuation, as explained below. Thus, in CAT for medical imaging, we use axial (line) measurements to get two-dimensional images (slices), and from that scan of images, we may proceed to digitally reconstruct a three-dimensional view. Here, we focus on the process that produces a single two-dimensional image from axial measurements. Currently, there is a trend towards greater automation of the basic routine operations performed by a specialist. The computer at the same time allows the expert report only extended additional diagnostic information and is not involved in the complex process of formation of the diagnosis [1].

Image thresholding is a very important problem in automated image analysis. Many image processing and computer vision applications usually require binary images (i.e. black and white) as an introductory step in order to do further processing. By choosing a particular intensity value as "threshold", images can be segmented by setting those pixels whose original intensity is above the threshold as "white pixels", and setting the other pixels as "black pixels". Thresholding is one of the easiest methods to automatically segment an image using a computer.

Therefore, the purpose of the thesis is the development of algorithm and software for select of the anatomical structures of chest based on computed tomography for determination of the pneumonia of lungs.

ОСНОВНИЙ ЗМІСТ КВАЛІФІКАЦІЙНОЇ РОБОТИ

In this Master's thesis, module of processing of CT-image was developed.

In first chapter described the main anatomical structures and Hounsfield Density of the chest, also given brief information about general principles of computed tomography, diseases of lungs.

In the second chapter developed block-diagrams of biotechnical system of CT research and image processing module.

In the third chapter the choice of methods of segmentation for anatomical structures of CT-data is done.

As result the developed software allows to select in HU organs of chest based on CT data.

This work will help improve processing and analysis CT-images. It would also help to monitor the results of treatment of the diseases of organs of the chest. This module can be used in specialized clinics and diagnostic centres.

ВИСНОВКИ

This Master's Thesis presents results of the development of an algorithm and software for select of the anatomical structures of the chest based on a computed tomography for determination of the pneumonia of lungs.

1. Analysis of medical and technical literatures shows that is extremely relevant task associated with increased accuracy and in formativeness of medical diagnostic procedures through the use of computer technology and methods of automated data processing. An analysis of the available software products showed that most programs do not allow you to perform tomography threshold segmentation. The images and their cost are comparable with the cost of hardware tomography systems.

2. The result of the calculation-developed graphics software allows execution pre-processing of tomography data, construction and automated analysis segmentation providing increase the diagnostic value of the method of threshold segmentation of image of chest.

3. CT software processing is very important to test the software before working with it successfully and thus helps to be safety software from any defect or lack of tools. The development of software for tomographic density analysis the images, allowing them to determine the characteristics (spatial localization, size, density) of the damaged structures. CT scan software helps make the necessary measurements length and intensity. The developed software for secondary processing CT-imaging data allows in automatic mode to calculate the parameters is required for the expansion of the space of diagnostic pathology of chest.

КЛЮЧОВІ СЛОВА

ГРУДНА КЛІТИНА, ЛЕГЕНІ, ПНЕВМОНІЯ, КОМП’ЮТЕРНА ТОМОГРАФІЯ, ЗОБРАЖЕННЯ, БІНАРІЗАЦІЯ, СЕГМЕНТАЦІЯ, СЕГМЕНТАЦІЯ ПОРОГОВА.

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