THE IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN X-RAY IMAGES

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Abstract: The use of artificial intelligence in X-ray images, the most widely used in radiology. Advantages of artificial intelligence in working with images.

Key words: radiation, X-ray, radiology, radiology, artificial intelligence, computer tomography, magnetic resonance tomography scanners, ultrasound, tomography, image, radiation, invasive

Radiology encompasses a variety of imaging modalities, each with unique advantages and applications. The most common imaging methods used in radiology are:

1 - X-rays

2- Computed tomography (CT) scanners

3- Magnetic resonance imaging (MRI) scans

4- Ultrasound

X-rays are one of the most widely used imaging methods in radiology. They show images of the internal structures of the body, such as bones, lungs, and other organs. X-rays use low levels of radiation to produce images, making them safe for most patients. Radiological imaging has many advantages for patients and doctors. Some of the main advantages of radiological imaging include:

Noninvasive: Radiologic imaging is often noninvasive, meaning it does not require surgery or other invasive procedures. This can reduce the risk of complications and reduce recovery time.

Accuracy: Radiological imaging techniques can provide highly realistic images of the body's internal structures, allowing doctors to more accurately diagnose and treat medical conditions.Efficiency: In some cases, X-ray imaging can provide rapid results, allowing doctors to diagnose and treat medical problems quickly.

Low risk: Most radiological imaging techniques have low levels of radiation exposure, and the benefits of imaging usually outweigh any potential risks. In recent years, artificial intelligence (AI) has been making significant progress in various fields.

X-ray field is no exception. Since radiologists work directly with images, it is important that the images are clear and of good quality. Analyzing medical images can be time-consuming and prone to

human error. However, the work done with the help of artificial intelligence has been proven to be effective. Scientists are conducting many scientific researches in this field.

The use of artificial intelligence (AI) in X-ray images is revolutionizing medicine. X-ray images are mainly used to show internal structures in the human body, and SI can help in analyzing these images in several ways. In the following directions, SI is used in the analysis of X-ray images:

Disease detection and diagnosis: Lung cancer: Artificial intelligence systems are used to analyze lung X-ray images to detect lung cancer or other lung diseases. SI systems can be highly accurate in detecting small changes and inaccuracies in chest x-rays.

Fractures and Injuries: Artificial intelligence is used to quickly analyze X-ray images to detect fractures in bones. The systems help detect complex fractures and especially small, nonspecific injuries.

Pneumonia and Infections: SI systems analyze data from X-ray images of the lungs to help diagnose pneumonia, tuberculosis and other lung infections.

Heart and Vascular Diseases: SI can be used to determine the condition of the heart and vascular system. X-rays can reveal the size of the heart and problems with the blood vessels. Automatic inference: Artificial intelligence systems automatically analyze X-ray images and help diagnose diseases. For example, systems can examine the lungs, heart, or bones to detect abnormalities, inflammation, or tumors.

Supporting physicians: SI systems support physicians in their analysis because they can sensitively detect small changes in X-ray images, reducing misdiagnoses. Doctors and radiologists check these automated analyzes to ensure accuracy.

Noise reduction: In X-ray images, there are sometimes errors or unclear areas in the image called "noise". Artificial intelligence is used to optimize and sharpen the images, which helps to make a more accurate diagnosis. Image Enhancement: Artificial intelligence systems are used to enhance X-ray images and improve viewing quality, helping to see small changes more clearly.

X-ray equipment health check: Artificial intelligence systems collect information about the quality of images obtained from X-ray equipment. If there are defects in the images, the system can detect them and notify the medical staff.

Image quality assessment: defects in the quality or dimensions of X-ray images are automatically detected by artificial intelligence systems, which allows the system to improve without requiring re-imaging.

Database creation: With the help of artificial intelligence, the information obtained from X-ray images is analyzed and large databases can be created. These databases are useful for medical research, for identifying and diagnosing new diseases.

Comparison of medical analysis: AI systems help to make more accurate and perfect diagnoses by comparing X-ray images with other medical data (for example, laboratory results or other images)

Save time: Automatic analysis of X-ray images saves time for doctors and radiologists. SI systems can quickly analyze images, simplifying doctors' work and freeing up more time to make other important medical decisions.Saving resources: There are not enough doctors and radiologists in small and medium-sized cities, remote areas or developing countries. Artificial intelligence serves as an important diagnostic tool in these areas.

Training radiologists: Artificial intelligence systems can help train radiologists. They analyze a large number of images and present real cases to new radiologists, which helps them increase their scientific and practical knowledge.

In conclusion, artificial intelligence plays an important role in speeding up medical diagnosis in X-ray images, increasing accuracy, and efficient organization of medical services. For doctors, these systems are a tool to support medical decisions, improve safety and save time in diagnosing diseases.

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