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Image Recognition in Healthcare

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ABSTRACT

Image recognition is an important branch of artificial intelligence (AI) that enables computers to identify, analyze, and interpret objects, patterns, and abnormalities in digital images. In healthcare, image recognition has become particularly valuable because medical professionals rely heavily on visual information obtained from X-rays, computed tomography (CT) scans, magnetic resonance imaging (MRI), ultrasound, pathology slides, retinal photographs, and other medical images. Through machine learning and especially deep learning, image-recognition systems can assist healthcare professionals in detecting diseases, evaluating medical conditions, and making more informed clinical decisions. Image recognition technologies are already actively working in clinical practice. Medical image recognition is the process of identifying and recognizing objects within medical images. It is about recognizing which objects are inside a medical image. It involves detecting and localizing objects, such as organs, and assigning labels to pixels or voxels in the image. In this paper, we will explore how image recognition technologies are transforming medical diagnostics and other areas in healthcare.

KEYWORDS: *Image recognition, image classification, image segmentation, healthcare, medicine.*

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INTRODUCTION

It is hard to imagine the field of modern healthcare without the development and harnessing of technology. As technologies continue to develop, novel implementations of various technologies and breakthroughs are both anticipated and indispensable. One example of such technologies is image recognition models that can be trained to offer versatile and significant uses within medicine. Image recognition and other solutions have been widely utilized in various medical fields to improve diagnosis accuracy and efficiency, while also minimizing instances of human error.

Image recognition has become an important application of artificial intelligence (AI) in modern healthcare. It refers to the ability of computer systems to identify, classify, and interpret objects, patterns, and abnormalities in digital images. Advances in machine learning, particularly deep learning and convolutional neural networks, have made it possible for computers to analyze large volumes of medical images with increasing speed and accuracy. Using technologies such as machine learning, deep learning, and computer vision, image recognition systems can analyze medical images and identify patterns that may indicate diseases or abnormalities. These technologies are increasingly applied to X-rays, computed tomography (CT) scans, magnetic resonance imaging (MRI), ultrasound images, retinal photographs, pathology slides, and dermatological images [1].

WHAT IS IMAGE RECOGNITION?

Image recognition is a computer vision task that enables machines to identify objects, people, and actions in images by analyzing pixel patterns through neural networks trained on labeled data. It is a technology that enables machines to interpret and understand visual data, similar to human perception. It is a subset of computer vision and employs various algorithms to identify objects, scenes, and patterns within images. It enables machines to interpret visual data and perform tasks that traditionally require human vision and understanding. For example, an

image recognition system can identify a person in a photograph, recognize a traffic sign, detect a tumor in a medical image, or distinguish between different species of animals. Image recognition systems allow computers to learn complex visual patterns from large datasets rather than relying entirely on manually designed features. The main model types include classifiers, object detectors, segmentation models, keypoint estimators, face recognition systems, and vision-language models, each suited to different problems. Figure 1 shows a representation of image recognition [2], while Figure 2 shows some professionals working on image recognition [3].

Although image recognition is closely related to image classification, object detection, and image segmentation, these concepts have different functions. Image classification assigns one or more labels to an entire image, such as identifying an image as containing a cat. Object detection identifies objects within an image and determines their locations, usually using bounding boxes. Image segmentation divides an image into meaningful regions or identifies the pixels belonging to particular objects. For example, an autonomous vehicle may use image classification to recognize a road scene, object detection to locate pedestrians, and image segmentation to distinguish roads from sidewalks. Figure 3 shows image recognition using bounding boxes to classify vehicles [3].

To humans, seeing an image means instantly recognizing familiar shapes, colors, or people. But for a computer, seeing is completely different; images are just numbers. How does image recognition work? At its core, image recognition works by analyzing the pixels of an image and identifying patterns. This is achieved through complex algorithms, most notably a type of computational model called neural network. Image recognition involves the following stages [1]:

- *Image acquisition*: The first stage (or the input layer) involves obtaining digital images from cameras, smartphones, scanners, satellites, medical imaging equipment, or other visual sensors. The images may be photographs, X-rays, satellite images, or video frames.
- *Image preprocessing*: After acquisition, images may undergo preprocessing to improve their quality and prepare them for analysis. Common preprocessing operations include resizing, normalization, noise reduction, and color adjustments. Preprocessing helps ensure that images are presented in a consistent format suitable for the recognition model. Engineers prepare images for analysis by normalizing the image, which means scaling pixel values to a standard range, typically between 0–1 or -1–1, so data is consistent and more manageable for machine learning models to process. Preprocessing also includes resizing images, converting them to grayscale to reduce computational complexity.
- *Feature extraction*: This involves identifying visual characteristics that distinguish one object or image category from another. Engineers must select the features that provide the most meaningful information. Traditional image recognition systems relied on manually designed features, such as edges, corners, textures, shapes, and color distributions. By annotating objects of interest within images, the models can more easily recognize and classify specific objects such as "cat" or "dog." Precisely annotated data allows machine learning algorithms to learn the visual features of each category accurately.
- *Encoding for machine learning*: Engineers extract these features and format them into numerical vectors, making it easier for machine learning models to process and compare images. Engineers translate each image into a fixed-length feature vector, a list of numbers summarizing its importance. Deep learning methods, particularly convolutional neural networks (CNNs), have revolutionized image recognition due to their ability to learn and extract features automatically from large datasets. Modern deep learning systems automatically learn relevant features from training data.
- *Output layer:* Finally, the data reaches the output layer, which consolidates the extracted features and produces a final prediction. This prediction is compared to the annotated training dataset to calculate errors and adjust the network's weights for improved accuracy.

When a new image is shown, the computer analyzes the pixels, detects features, compares them with what it has learned and outputs a label (e.g., "raccoon") with a confidence score (e.g., 94.7%). Figure 4 shows how image recognition works [4].

IMAGE RECOGNITION IN HEALTHCARE

The identification of medical images is an essential task in computer-aided diagnosis, medical image retrieval, and mining. With the development of medical imaging analysis technology, medical images are becoming more and more important in clinical diagnosis. Image recognition technology is significantly transforming healthcare by enhancing diagnostics and treatment processes. It is rapidly becoming an important component of modern

healthcare. Powered largely by artificial intelligence (AI), machine learning, and deep learning, image-recognition systems can analyze medical images and identify patterns that may indicate disease or other abnormalities. Image recognition enables healthcare professionals to identify conditions such as tumors, lesions, and other abnormalities with greater accuracy and speed. It has enormous potential to improve healthcare by assisting in disease detection, medical imaging analysis, diagnostic decision-making, and clinical efficiency [5]. Machine learning (ML) and image recognition are transforming the healthcare industry. From diagnosing diseases to monitoring patients, ML-powered image analysis brings accuracy, speed, and efficiency that were once impossible with traditional methods. Figure 5 shows image recognition using machine learning [6].

Image recognition is a subfield of deep learning that uses computer vision to identify the content of images. Image recognition models can assist in the diagnosing of various conditions. When used to improve the accuracy and speed of medical diagnoses, the image recognition models bring significant health benefits to patients who benefit from early treatment. They also deliver significant financial benefits for hospitals by reducing the probability of human error and the expenses incurred by misdiagnosis. Image recognition should be developed and implemented as a tool that supports healthcare professionals rather than simply replacing human expertise. With rigorous validation, appropriate safeguards, effective oversight, and responsible use, image recognition can become an increasingly valuable component of modern healthcare while maintaining the central priorities of patient safety, quality of care, and human judgment [1,7]. Figure 6 shows a representation of image recognition in healthcare [8].

APPLICATIONS OF IMAGE RECOGNITION IN HEALTHCARE

AI-powered image recognition in healthcare is gradually changing the landscape. Image recognition has numerous applications across healthcare, including medical diagnosis, disease detection, radiology, cancer detection, pathology, ophthalmology, dermatology, dentistry, surgery, patient monitoring, medical research, and personalized treatment. Common applications of image recognition in healthcare include the following [1,9,10]:

Medical Diagnosis: A major application of image recognition in healthcare is medical diagnosis. Every year, medical facilities worldwide generate billions of diagnostic images – X-rays, CT scans, MRIs, mammograms. Behind each one is a patient awaiting an accurate diagnosis. Medical images contain enormous amounts of information, but abnormalities can sometimes be subtle or difficult to identify. AI systems can be trained using large collections of labeled medical images so that they learn patterns associated with particular diseases. Once trained and appropriately validated, these systems can help identify suspicious findings and draw clinicians' attention to areas requiring further examination. Rather than automatically replacing medical professionals, image recognition is often most useful as a decision-support technology that complements professional judgment. For example, it can identify the number and exact locations of tumors within an image. Figure 7 shows a typical medical image [7], while Figure 8 displays some medical professionals examining medical images [9].

- *Surgery:* Robot surgical guidance is another highly promising use of image recognition in healthcare. Surgeons can use AI-assisted imaging systems to identify anatomical structures, tumors, blood vessels, and other important features before and during procedures. When image recognition is combined with three-dimensional imaging, robotics, or augmented reality, surgeons may receive additional visual guidance during complex operations. In surgery, computer vision and image recognition can help identify anatomical structures and support image-guided procedures. In dentistry, algorithms can assist in examining dental X-rays for cavities, bone loss, and other abnormalities. In cardiology, medical images can be analyzed to evaluate the structure and function of the heart. Image analysis can also be used to measure tumors, estimate organ volumes, segment anatomical structures, and monitor changes in disease over time.
- *Radiology:* Radiology is one of the most prominent areas in which image recognition is applied. Radiologists routinely examine X-rays, CT scans, MRI scans, and other images to detect fractures, tumors, infections, internal bleeding, and abnormalities of organs and tissues. Deep-learning algorithms, particularly convolutional neural networks, can analyze these images and identify complex visual patterns. For example, image-recognition systems may assist in detecting lung nodules on chest images, identifying abnormalities in brain scans, or highlighting suspected fractures on X-rays. Such assistance may improve workflow by helping clinicians prioritize images that require urgent attention.

- *Cancer Treatment*: Image recognition also has significant applications in cancer detection and treatment. Cancer diagnosis often depends on recognizing abnormal cells, tissues, masses, or lesions. AI-based image analysis can help evaluate mammograms for signs of breast cancer, examine CT scans for suspicious lung nodules, and analyze pathology images for characteristics associated with malignant disease. In digital pathology, tissue samples can be converted into high-resolution digital images that computer algorithms analyze for patterns. These systems can help pathologists locate suspicious areas and quantify features that may be difficult or time-consuming to evaluate manually.
- *Ophthalmology*: Another important application is ophthalmology. The eye provides visible evidence of several diseases, making retinal images suitable for computer-assisted analysis. Image-recognition technologies can analyze photographs of the retina for signs of conditions such as diabetic retinopathy, glaucoma, and age-related macular degeneration. Early detection is especially important because some eye diseases can progress without obvious symptoms until substantial damage has occurred. Automated image analysis can therefore support screening programs, particularly where access to specialists is limited.
- *Dermatology*: Image recognition is also being used in dermatology. Skin conditions often produce visible changes in color, texture, shape, and structure. AI systems can analyze photographs or specialized images of skin lesions and compare their characteristics with patterns learned from previous cases. However, performance can vary across patient populations, skin tones, imaging conditions, and devices, making diverse training data and careful clinical validation essential.
- *Pathology:* Image recognition is also increasingly important in digital pathology. Traditionally, pathologists examine tissue samples under microscopes to identify abnormal cells and diagnose diseases. With digital pathology, tissue slides can be converted into high-resolution digital images. AI systems can then analyze these images to locate suspicious regions, recognize cellular patterns, quantify certain features, and assist with the classification of disease. Because pathology slides can contain enormous amounts of visual information, automated image analysis may help pathologists work more efficiently while providing additional quantitative information for clinical decision-making.
- *Patient Monitoring*: Another application is patient monitoring and safety. Computer vision systems can analyze video or image data to recognize certain patient movements and behaviors. For example, healthcare facilities may use appropriately designed systems to identify patients at risk of falling, monitor mobility during rehabilitation, or observe whether particular safety procedures are being followed. Such applications must be implemented carefully because continuous visual monitoring raises important questions concerning patient privacy, consent, and data security.
- *Dentistry:* Image recognition is also useful in dentistry. Dental X-rays and oral images can be analyzed to help identify cavities, periodontal disease, bone abnormalities, and other dental conditions. AI-assisted systems may highlight suspicious areas for dentists to examine more closely. In orthodontics and oral surgery, imaging technologies can also contribute to treatment planning and assessment.
- *Medical Research*: Another promising application involves medical research and drug development. Researchers often analyze thousands or millions of microscopic images of cells and tissues. Image recognition can automate parts of this process by identifying cells, measuring changes in cellular structures, and classifying biological responses. This allows researchers to process large datasets more rapidly and may contribute to the discovery of new treatments and a better understanding of disease mechanisms.
- *Personalized Medicine*: Image recognition can further support personalized medicine and treatment monitoring. Medical images collected over time provide valuable information about how an individual patient is responding to treatment. AI systems can compare successive images, measure changes, and detect patterns that may be difficult to quantify manually. Physicians can combine this information with laboratory results, medical history, genetic information, and other clinical data when making treatment decisions.
- *Rehabilitation*: In the field of rehabilitation, computer vision tools allow medical practitioners to provide care and advice virtually so that patients can recover at ease in their homes. Specialists can provide the needed physical therapy consultations, while also tracking patients' progress. In addition, image recognition

technologies are also being used in fall prevention systems for elderly and injured patients.

BENEFITS

Image recognition offers substantial benefits to modern healthcare. It can improve diagnostic support, facilitate earlier disease detection, accelerate medical-image analysis, reduce repetitive workloads, increase consistency, support personalized treatment, and expand access to diagnostic services. Other benefits of image recognition in healthcare include the following [1,8]:

- *Speed:* Speed and precision are crucial when it comes to saving people's lives. One major advantage of image recognition in healthcare is its potential to improve speed and efficiency. Hospitals and medical centers generate enormous numbers of images, creating substantial workloads for radiologists, pathologists, and other specialists. AI systems can rapidly process images, flag potentially abnormal findings, perform measurements, and help prioritize cases. This may reduce repetitive work and allow healthcare professionals to devote more attention to complex cases and patient care.
- *Greater Consistency*: Image recognition may contribute to greater consistency. Human interpretation can sometimes vary among professionals because of differences in experience, workload, fatigue, or judgment. A properly developed algorithm applies its learned computational procedure consistently.
- *Improved Accuracy*: One of the major benefits of image recognition in healthcare is its potential to improve diagnostic accuracy. Medical images may contain subtle abnormalities that can be difficult to recognize, particularly when clinicians are dealing with large numbers of images or complex cases. For example, image recognition can assist radiologists in identifying suspicious masses in mammograms, lung nodules in chest scans, fractures in X-rays, and abnormalities in brain images.
- *Early Detection:* Early diagnosis is important because many diseases are easier to treat when discovered before they become advanced. Image recognition systems can detect subtle changes in medical images that may indicate the early stages of disease. This capability is particularly valuable in areas such as cancer detection, ophthalmology, neurology, and cardiovascular medicine.
- *Faster Analysis*: Modern healthcare facilities generate enormous numbers of medical images every day. Reviewing these images manually can require considerable time and specialized expertise. Image recognition can rapidly analyze large volumes of images and highlight areas that may require closer examination. This capability can improve workflow within radiology departments and other diagnostic services.
- *Reduced Workload:* Healthcare professionals frequently work under significant pressure. Radiologists, pathologists, ophthalmologists, dermatologists, and other specialists may have to examine large numbers of images while maintaining a high level of concentration. Image recognition can automate some repetitive aspects of image analysis. A system may identify anatomical structures, measure abnormalities, classify certain findings, or flag suspicious regions for further examination. Automating such tasks can allow professionals to devote more attention to complex cases.
- *Support for Cancer Diagnosis*: Cancer diagnosis is one of the most promising applications of image recognition. AI systems can analyze mammograms, CT scans, MRI scans, ultrasound images, and digital pathology slides to identify suspicious patterns. In pathology, image recognition can help analyze digitized tissue samples and identify areas that may contain abnormal or malignant cells. In radiology, algorithms can highlight suspicious lesions that require further investigation. Such systems can function as decision-support tools for specialists, potentially improving the speed and consistency of cancer assessment.
- *Better Monitoring:* Image recognition is useful not only for detecting diseases but also for monitoring them over time. Healthcare professionals often compare medical images taken at different stages of treatment to determine whether a condition is improving, worsening, or remaining stable. Computer systems can measure changes in tumors, lesions, organs, blood vessels, or other anatomical structures. By comparing images systematically, image recognition can provide quantitative information about disease progression.
- *Personalized Treatment*: Image recognition provides innumerable benefits in providing personalized treatment for patients. It can contribute to personalized medicine by extracting detailed information from medical images. Imaging characteristics can sometimes provide information about the nature, location, size, and progression of a disease. When imaging information is combined with laboratory results,

medical history, genetic information, and other clinical data, healthcare providers may gain a more comprehensive understanding of an individual patient's condition. This information can support treatment planning that is better tailored to the patient's particular circumstances.

- *Expanded Access*: Another important benefit of image recognition is its potential to improve healthcare access in underserved regions. Some communities lack sufficient numbers of radiologists, ophthalmologists, pathologists, and other specialists. AI-assisted image analysis can support healthcare workers by providing preliminary assessments or screening assistance where specialists are not immediately available. Medical images can also be transmitted through telemedicine systems for remote evaluation. In this way, image recognition can complement specialist services and help extend diagnostic capabilities to populations with limited access to advanced healthcare.
- *Cost Reduction:* Image recognition may also contribute to healthcare cost reduction when appropriately implemented. Faster diagnosis, earlier disease detection, automated screening, and more efficient use of specialist time can potentially reduce unnecessary procedures and delays.
- *Enhanced Medical Research*: Medical researchers can use image recognition to analyze large collections of medical images much faster than would be practical through manual examination alone. AI systems can search for patterns, classify images, measure anatomical features, and identify associations that may contribute to scientific discoveries. This capability can support research into cancer, neurological disorders, cardiovascular diseases, eye diseases, and many other conditions.

CHALLENGES

In spite of its potential benefits, image recognition in healthcare presents significant challenges and ethical concerns. Challenges involving data privacy, data quality, cybersecurity, algorithmic bias, accuracy, explainability, regulation, generalization, professional oversight, implementation cost, and accountability must also be carefully addressed. Other challenges of image recognition in healthcare include the following [1]:

- *Implementation Cost*: Developing and implementing sophisticated image recognition systems can be expensive. Healthcare institutions may need specialized computing infrastructure, secure data-storage systems, software integration, technical personnel, system maintenance, and staff training. Large healthcare organizations may have the resources necessary to implement advanced AI systems, while smaller hospitals and clinics may face greater financial and technical barriers. Such disparities could contribute to unequal access to AI-assisted healthcare technologies.
- *Data Quality:* One major challenge is obtaining sufficient quantities of high-quality medical images for developing image recognition systems. Deep learning models generally require large and diverse datasets for effective training. However, medical images can be difficult to obtain because they contain sensitive patient information and are protected by privacy and confidentiality requirements. The quality of available data can also vary considerably. Poor-quality or incorrectly labeled training data can consequently produce unreliable results.
- *Data Privacy:* Medical images are part of sensitive health information. Collecting, storing, transferring, and analyzing such information creates important privacy and cybersecurity concerns. Healthcare organizations must ensure that patient information is appropriately protected and that applicable privacy requirements are followed. Cyberattacks or unauthorized access to databases containing medical images could compromise patient confidentiality and reduce trust in healthcare AI systems.
- *Ethical Concerns*: The use of image recognition in healthcare raises broader ethical questions involving fairness, transparency, consent, privacy, accessibility, and accountability. Patients should receive healthcare in which AI technologies are used responsibly and without unjust discrimination. Healthcare institutions and technology developers must therefore consider ethical principles throughout the entire AI lifecycle—from data collection and model development to validation, deployment, monitoring, and eventual replacement.
- *Bias:* Bias is another major concern in medical image recognition. An AI system is influenced by the data on which it was trained. If a training dataset does not adequately represent different populations, disease presentations, equipment types, and healthcare environments, the resulting system may perform unevenly across groups or settings. For example, a model trained primarily using images from one hospital system may perform differently when introduced into another

institution using different equipment or serving a different patient population.

- *Diagnostic Errors:* No image recognition system is perfectly accurate. AI models can produce false positives, in which an abnormality is identified when none is present, and false negatives, in which an existing abnormality is missed. Both types of errors can have serious consequences. False positives may lead to unnecessary testing, anxiety, procedures, and healthcare costs. False negatives may delay diagnosis and treatment. The potential consequences are particularly important when image recognition is used in areas such as cancer detection, stroke assessment, or other conditions in which timely diagnosis can significantly influence outcomes.
- *Lack of Explainability*: Many sophisticated image recognition systems, particularly deep neural networks, operate as what are sometimes described as "black-box" systems. They may generate highly accurate predictions without providing an easily understandable explanation of how a particular conclusion was reached. This creates difficulties in healthcare because clinicians often need to understand the evidence supporting a diagnostic recommendation.
- *Integration*: Even an accurate image recognition system may provide limited benefit if it cannot be integrated effectively into everyday clinical practice. Hospitals often operate complex combinations of electronic health records, picture archiving and communication systems, imaging equipment, and other information technologies. Introducing an AI system may require changes in software infrastructure, clinical procedures, data management, and staff responsibilities. Poor integration can increase workloads rather than reduce them.
- *Regulation*: Medical image recognition systems used for clinical purposes may be subject to significant regulatory requirements. Developers may need to demonstrate safety, effectiveness, reliability, and appropriate performance before certain systems can be deployed clinically. AI also introduces questions concerning responsibility when errors occur. Establishing appropriate standards of accountability remains an important part of the development and adoption of healthcare AI.
- *Generalization*: An image recognition model that performs well during development may not necessarily maintain the same performance after deployment. Changes in imaging equipment, clinical practices, patient populations, disease patterns, or data-processing methods can affect model performance over time. Healthcare institutions therefore need procedures for monitoring deployed systems and detecting performance deterioration.
- *Human–AI Collaboration*: Another challenge is determining the appropriate relationship between healthcare professionals and artificial intelligence. Excessive reliance on automated recommendations may create automation bias, in which clinicians give too much weight to an AI result. Conversely, clinicians who distrust AI may ignore useful information provided by an effective system. The goal should therefore be productive human–AI collaboration. AI can rapidly analyze large amounts of imaging data and identify subtle patterns, while healthcare professionals contribute clinical knowledge, patient history, contextual understanding, communication, and professional judgment.

FUTURE OF IMAGE RECOGNITION IN HEALTHCARE

The future of image recognition in healthcare is highly promising. Advances in deep learning, multimodal AI, medical imaging, computing power, and digital health systems may enable increasingly sophisticated analysis. Continued advances in artificial intelligence, medical imaging, robotics, portable devices, and multimodal data analysis could transform how diseases are detected, diagnosed, monitored, and treated. Future systems may combine images with laboratory results, medical histories, genomic information, and other clinical data to provide more comprehensive decision support. Image recognition may enable earlier detection, more personalized treatment, more efficient clinical workflows, improved surgical guidance, and greater access to specialized healthcare.

In the future, advances in image recognition are expected to make medical imaging more accurate, efficient, personalized, and accessible while strengthening the ability of healthcare professionals to diagnose and manage disease. An important development will be the growing use of multimodal artificial intelligence. Rather than analyzing medical images in isolation, future systems may combine imaging information with laboratory results, electronic health records, genetic information, symptoms, medications, and other clinical data. The future of image recognition is also closely connected with personalized medicine. Patients with the same disease may respond differently to treatment because of differences in genetics, physiology, lifestyle,

disease stage, and other factors. The most productive future is therefore likely to be one in which image-recognition technology works alongside healthcare professionals, strengthening rather than replacing human expertise and helping deliver safer, more timely, and more patient-centered care [1].

CONCLUSION

Image recognition is transforming the analysis of medical images by enabling computers to identify patterns and abnormalities with increasing sophistication. Through accurate object detection and ever-improving image classification and segmentation, image recognition is the leading source of innovation in medical services. The technology has the potential to support earlier detection, improve efficiency, assist clinical decision-making, and expand access to healthcare services.

However, image recognition should generally be regarded as a tool for supporting healthcare professionals rather than as a universal substitute for human expertise. Medical decisions often require consideration of symptoms, medical history, laboratory findings, patient preferences, and other information that extends beyond an image. When responsibly designed, validated, and integrated into clinical practice, image recognition can strengthen the capabilities of healthcare professionals and contribute to more efficient, accessible, and patient-centered healthcare. Whether you are a healthcare innovator or AI enthusiast, now is the best time to explore this powerful intersection of technology and medicine. More information about image recognition in healthcare can be found in the books in [11-14].

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Figure 1 A representation of image recognition [2].



Figure 2 Some professionals working on image recognition [3].



Figure 3 Image recognition using bounding boxes to classify vehicles [3].

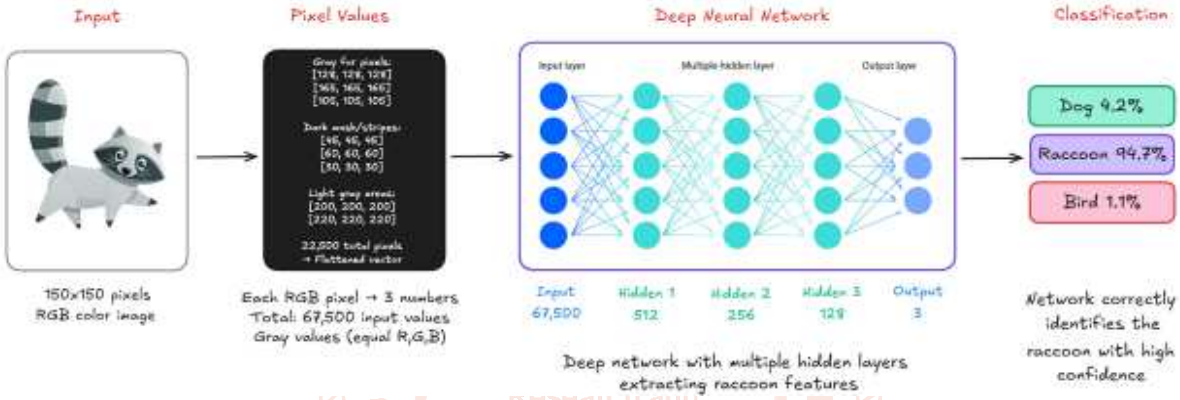


Figure 4 How image recognition works [4].

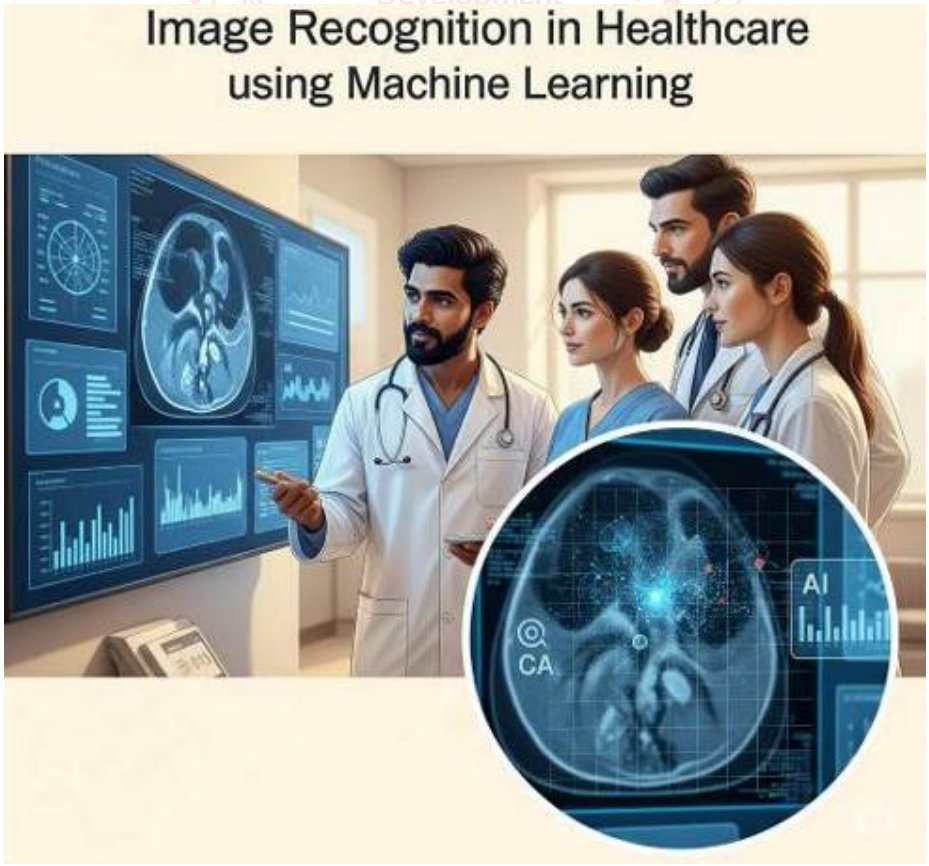


Figure 5 Image recognition using machine learning [6].



Figure 6 A representation of image recognition in healthcare [8].



Figure 7 A typical medical image [7].



Figure 8 Some medical professionals examining medical images [9].

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