Global Artificial Intelligence (AI) in Medical Imaging Market - Focused Insights 2024-2029

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Report description:

The global AI in medical imaging market is expected to grow at a CAGR of 47.84% from 2023 to 2029.

MARKET TRENDS & DRIVERS

Advancements in Deep Learning and Neural Networks

Technological advancements in AI for medical imaging are revolutionizing the field by enhancing diagnostic accuracy, increasing efficiency, and reducing costs. Deep learning and neural networks, particularly Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs), are widely used for image recognition and sequence analysis, respectively, making them ideal for analyzing various medical images. Automated image analysis, including segmentation, detection, and pattern recognition, helps radiologists focus on specific areas of interest, such as delineating tumor boundaries or identifying disease-specific patterns. Natural Language Processing (NLP) further aids in generating detailed reports and providing clinical decision support by extracting relevant information from patient records. Seamless integration with Picture Archiving and Communication Systems (PACS), Radiology Information Systems (RIS), and cloud-based solutions streamlines workflows and facilitates collaborative research. Enhanced imaging techniques like 3D, 4D, and multi-modal imaging, combined with real-time image enhancement and reconstruction, improve the quality and comprehensiveness of medical imaging. Predictive analytics and personalized medicine benefit from AI's ability to assess risk, predict outcomes, and tailor treatment plans based on specific disease characteristics. Increasing numbers of AI in imaging tools are receiving regulatory approvals, ensuring their safety and efficacy, while standardization efforts aim to maintain consistency across healthcare settings. Collaborative research and open data initiatives, supported by large annotated medical imaging datasets, are accelerating the development and implementation of AI in Medical Imaging.

Virtual and Augmented Reality with 3D Medical Imaging

Virtual and augmented reality (VR/AR) technologies are revolutionizing the healthcare industry, particularly in medical imaging. By integrating VR/AR with 3D medical imaging data, healthcare professionals gain unprecedented visualization and planning capabilities for various medical procedures. Augmented reality offers unique benefits in medical settings. AR technology overlays digital information onto the user's real-world environment, enabling clinicians to visualize medical data in the context of the patient's anatomy. For example, during surgical procedures, AR can superimpose 3D medical images directly onto the patient's body, providing real-time guidance and assistance to surgeons. This capability allows surgeons to "see through" obstacles, such as tissues or organs, and precisely navigate surgical instruments, improving surgical precision and reducing the risk of complications. Furthermore, AR can facilitate high-risk operations by providing surgeons with enhanced visualization and decision-support tools. For instance, AR overlays vital patient information, such as medical images, diagnostic data, and real-time physiological parameters, directly into the surgeon's field of view during surgery. This augmented information enables surgeons to make informed decisions and perform complex procedures more confidently and accurately. Overall, integrating VR/AR technologies with 3D medical imaging data offers transformative benefits in healthcare, ranging from enhanced visualization and planning capabilities to improved surgical precision and patient outcomes. As these technologies continue to advance, they have the potential to revolutionize medical practice and redefine standards of care across various medical specialties.

Addressing the Surge in Medical Imaging Demand through AI Solutions

The escalating incidence of chronic diseases, such as cancer, cardiovascular ailments, and neurological disorders, has precipitated a surge in the demand for medical imaging procedures. This upsurge places considerable strain on healthcare systems, underscoring the urgent need for innovative solutions to manage the growing workload. AI technology has emerged as a transformative tool in medical imaging. By harnessing the power of machine learning algorithms and deep learning techniques, AI systems can automate various facets of the imaging process, from image analysis to interpretation. This automation enhances the efficiency and speed of diagnosis and improves the accuracy and reliability of results. Moreover, AI-enabled medical imaging facilitates early detection and characterization of diseases, enabling timely interventions and personalized treatment strategies. This convergence of rising chronic disease prevalence and the adoption of AI in Medical Imaging represents a paradigm shift in healthcare delivery, promising improved patient outcomes, enhanced workflow efficiency, and greater diagnostic precision. As AI continues to evolve and integrate into clinical practice, its role in medical imaging is poised to expand, offering new opportunities to address the challenges posed by the growing burden of chronic diseases. Demand for almost all aspects of diagnostic procedures is increasing every year. The widespread consensus is that demand will continue to rise due to the increasing prevalence of chronic illnesses worldwide. The increase in the demand has been driven partly by an increase in imaging activity across many aspects of acute hospital activity, with increases in demand from urgent referrals for cancer (10% per year) imaging. Wider indications for tests such as CT scanning are also fuelling the demand.

INDUSTRY RESTRAINTS

Lower Adoption in LMICs

Low- and middle-income countries (LMICs) face significant barriers to adopting artificial intelligence (AI) in healthcare. Limited financial resources, inadequate digital infrastructure, and a shortage of skilled professionals hinder the implementation of AI in solutions. Moreover, cultural skepticism, divergent public policies, and unique medical practice patterns pose additional challenges. These factors contribute to lower adoption rates of AI technologies in LMICs compared to high-income countries. Addressing these barriers requires targeted investments in digital health infrastructure, capacity-building initiatives, and collaborative efforts between governments, healthcare providers, and technology developers. By overcoming these challenges, LMICs can harness the potential of AI to improve healthcare delivery, enhance diagnostic accuracy, and, ultimately, advance public health outcomes. Implementing AI in a country where there is a lack of education can result in more challenges. Successful AI adoption in low- and middle-income countries needs education of local radiology leadership in AI validation. A common problem

in AI deployment is algorithm generalizability.

SEGMENTATION INSIGHTS

INSIGHT BY TECHNOLOGY TYPE

The global AI in medical imaging market by technology type is segmented into deep learning, virtual AI & context-aware computing, and natural language processing. The deep learning segment held the largest share in 2023. The deep learning technology market in medical imaging is poised for continued growth, driven by technological advancements, increasing healthcare needs, and supportive regulatory environments. Innovations in AI algorithms, improvements in computational power, and greater integration of AI with existing medical systems will further propel the adoption and impact of deep learning in medical imaging. Deep learning algorithms will continue to improve accuracy, enabling even earlier detection of diseases with higher precision. These advancements will facilitate quicker diagnoses, providing more timely interventions and better patient outcomes.

By Technology
o Deep Learning
o Virtual AI & Context-Aware Computing
o Natural Language Processing

INSIGHT BY APPLICATION TYPE

The global AI in the medical imaging market by application type is categorized into neurology, respiratory & pulmonary, cardiology, breast cancer, orthopedics, and others. The neurology segment shows significant growth, with the fastest-growing CAGR during the forecast period. The adoption of artificial intelligence (AI) in neuroscience has seen significant growth in recent years, driven by advancements in machine learning, increased computational power, and the availability of large datasets. AI has revolutionized the analysis of brain imaging data using techniques such as MRI, fMRI, and PET scans. Machine learning algorithms can now accurately identify patterns and anomalies, aiding in diagnosing neurological conditions like Alzheimer's disease, Parkinson's disease, and multiple sclerosis. In the realm of neuropharmacology, AI assists in the discovery and development of new drugs for neurological diseases. Machine learning models can predict the efficacy and safety of potential drug candidates by analyzing biological and chemical data. This accelerates the drug discovery process and reduces the costs of bringing new treatments to market.

? By Application
o Neurology
o Respiratory & Pulmonary
o Cardiology
o Breast Cancer
o Orthopedic
o Others

INSIGHT BY MODALITIES TYPE

By modalities type, the MRI segment shows the highest growth in the global AI in the medical imaging market. Integrating artificial intelligence (AI) with MRI technology has significantly enhanced diagnostic accuracy in medical imaging. GE Healthcare reports an impressive increase in accuracy, sensitivity, and specificity, with AI-enabled MRI achieving greater than 80% accuracy and sensitivity and 87% specificity compared to MRI data alone. This advancement holds promise in Alzheimer's disease, where AI is poised to revolutionize MRI by transforming qualitative clinical applications into a new era of quantitative imaging, leveraging

vast amounts of data for improved diagnosis and treatment, thus helping segmental growth.

?By Modalities
oCT Scan
oMagnetic Resonance Imaging
oX-Ray
oUltrasound
oNuclear Imaging

INSIGHT BY END-USER TYPE

The hospital segment dominates with the largest share of the global AI in the medical imaging market. The segmental growth is due to the greater number of hospitals associated with medical imaging technologies for diagnosis. The rise in chronic diseases such as cancer, cardiovascular conditions, neurological disorders, and respiratory diseases has escalated the demand for medical imaging in hospitals, putting substantial pressure on radiologists and conventional imaging systems. But in recent years, the incorporation of AI in medical imaging systems, utilizing technologies like deep learning and natural language processing, has significantly enhanced hospital productivity and efficiency.

?By End-User
oHospitals
oDiagnostic Imaging Centers
oOthers

GEOGRAPHICAL ANALYSIS

The U.S. dominates the global AI in medical imaging market with the largest share in the North American region. The AI in the medical imaging market in North America is experiencing significant growth, driven by advancements in technology, the increasing prevalence of chronic diseases, and the need for efficient and accurate diagnostic tools. The U.S. dominates the region because many radiologists and hospitals prefer AI in medical imaging software/applications. The increased adoption is also observed due to a good healthcare system in the U.S. With ongoing advancements in AI technologies and increasing investments in research and development, the market is expected to see widespread adoption across healthcare settings. The focus will be improving diagnostic accuracy, enhancing patient outcomes, and streamlining workflows to meet the growing demand for efficient and effective medical imaging solutions.

By Geography

?North America
oThe U.S.
oCanada
?Europe
oGermany
oThe U.K.
oFrance
oItaly
oSpain
?APAC
oJapan

o China
o India
o Australia
o South Korea
? Latin America
o Brazil
o Mexico
o Argentina
? Middle East & Africa
o Turkey
o South Africa
o Saudi Arabia

COMPETITIVE LANDSCAPE

The global AI in medical imaging market report contains exclusive data on 46 vendors. The AI in medical imaging market is highly fragmented, with limited global presence, and several regional and local players are offering AI in medical imaging solutions in a wide range. The major global AI players in medical imaging are Siemens Healthineers, General Electric, Koninklijke Philips, IBM Watson Health, and Fujifilm. Global players focus on developing innovative products with advanced technologies and expanding their product portfolio to remain competitive. They continuously invest extensively in R&D and product development activities to expand their portfolio.

Key Vendors

? General Electric
? Siemens Healthineers
? Koninklijke Philips
? IBM Watson Health
? Fujifilm

Other Prominent Vendors

? Agfa-Gevaert
? Avicenna.AI
? AZmed
? Butterfly Network
? CellmatiQ
? dentalXrai
? Digital Diagnostics
? EchoNous
? Gleamer
? iCAD
? Lunit
? Mediaire
? Microsoft
? NVIDIA
? Intel

?Nanox Imaging
?Paige AI
?Perimeter Medical Imaging AI
?Autodesk
?Aidence
?ContextVision
?Exo
?Predible Health
?Paragon Biosciences
?1QB Information Technologies
?Qure.ai
?Quantib
?Quibim
?Vista.ai
?Renalytix
?Tempus
?Therapixel
?Ultromics
?Viz.ai
?VUNO
?Merative
?Google Cloud
?InformAI
?HeartFlow
?Enlitic
?Brainomix

KEY QUESTIONS ANSWERED:

1.How big is the global AI in the medical imaging market?
2.What are the key drivers of the global AI in the medical imaging market?
3.Who are the major players in the global AI in medical imaging market?
4.What is the growth rate of the global AI in the medical imaging market?
5.Which region dominates the global AI in the medical imaging market?

Table of Contents:

o Neurology
o Respiratory & Pulmonary
o Cardiology
o Breast Cancer
o Orthopedic
o Others
- GLOBAL: Projected Revenue by Modalities (2020-2029; $Millions)
o Computed Tomography
o Magnetic Resonance Imaging
o X-Ray
o Ultrasound
o Nuclear Imaging
- GLOBAL: Projected Revenue by End-User (2020-2029; $Millions)
o Hospitals
o Diagnostic Imaging Centers
o Others
CHAPTER 4: Key Regions Overview
- North America: Projected Revenue of AI in Medical Imaging Market (2020-2029; $Millions)
o Projected Revenue of AI in Medical Imaging Market in US
o Projected Revenue of AI in Medical Imaging Market in Canada
- Europe: Projected Revenue of AI in Medical Imaging Market (2020-2029; $Millions)
o Projected Revenue of AI in Medical Imaging Market in Germany
o Projected Revenue of AI in Medical Imaging Market in UK
o Projected Revenue of AI in Medical Imaging Market in France
o Projected Revenue of AI in Medical Imaging Market in Italy
o Projected Revenue of AI in Medical Imaging Market in Spain
- APAC: Projected Revenue of AI in Medical Imaging Market (2020-2029; $Millions)
o Projected Revenue of AI in Medical Imaging Market in China
o Projected Revenue of AI in Medical Imaging Market in Japan
o Projected Revenue of AI in Medical Imaging Market in India
o Projected Revenue of AI in Medical Imaging Market in Australia
o Projected Revenue of AI in Medical Imaging Market in South Korea
- Latin America: Projected Revenue of AI in Medical Imaging Market (2020-2029; $Millions)
o Projected Revenue of AI in Medical Imaging Market in Brazil
o Projected Revenue of AI in Medical Imaging Market in Mexico
o Projected Revenue of AI in Medical Imaging Market in Argentina
- Middle East & Africa: Projected Revenue of AI in Medical Imaging Market (2020-2029; $Millions)
o Projected Revenue of AI in Medical Imaging in Turkey
o Projected Revenue of AI in Medical Imaging Market in Saudi Arabia
o Projected Revenue of AI in Medical Imaging Market in UAE
CHAPTER 5: AI in Medical Imaging Market Prospects & Opportunities
- AI in Medical Imaging Market Opportunities & Trends
- AI in Medical Imaging Market Drivers
- AI in Medical Imaging Market Constraints
CHAPTER 6: AI in Medical Imaging Industry Overview
- AI in Medical Imaging Market - Competitive Landscape
- AI in Medical Imaging Market - Key Vendor Profiles

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