





The Role of Electrical Engineering in Medical Imaging

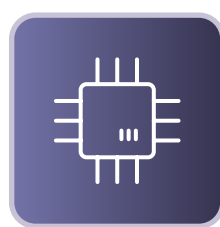
Evolution of Medical Imaging

1895	1970s	1970s	1990s
X-RAYS  <p>Discovered in 1895; improved by electrical engineering for safety and precision.</p>	MRI  <p>Developed in the 1970s; uses radio waves and magnetic fields; enhanced by engineers.</p>	CT SCANS  <p>Introduced in the 1970s; combines X-rays and computers; optimized by engineers for better resolution and safety.</p>	DIGITAL IMAGING  <p>Emerged in the 1990s; transitioned from film to digital; developed digital sensors and processing algorithms.</p>

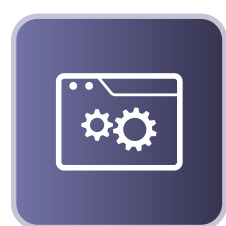
Key Contributions of Electrical Engineers



SIGNAL PROCESSING
Enhances image quality with filtering and noise reduction.



HARDWARE DEVELOPMENT
Designs advanced sensors and compact imaging devices.



SOFTWARE ENGINEERING
Creates software for image processing and machine learning.



INSTRUMENTATION
Develops precise instruments for non-invasive imaging.

Advanced Imaging Techniques



Uses sound waves; improved transducer technology and algorithms.



Includes PET and SPECT; designed and optimized by engineers for accuracy.

Future Trends in Medical Imaging



AI AND MACHINE LEARNING
Enhance diagnostics and automate abnormality detection.



MINIATURIZATION
Develops portable, wearable imaging devices.



INTEGRATION
Combines imaging with robotics and telemedicine.



Challenges and Considerations



Minimizes radiation exposure and ensures safe use.



Balances innovation with affordability and accessibility.



Addresses privacy and ensures informed consent.