

Intelligent Operations on SPECT and PET Imaging

Sonali Parate, Sakshi Wasekar, Divya Rahate, Achal Borkar, Ashwini Chandalarwar

Students, Department of CSE

Rajiv Gandhi College of Engineering Research and Technology, Chandrapur, Maharashtra, India

Abstract: *The rapid advancement of medical imaging technology has significantly enhanced diagnostic capabilities in healthcare, particularly through modalities such as Single Photon Emission Computed Tomography (SPECT) and Positron Emission Tomography (PET). This project aims to leverage deep learning techniques to perform intelligent operations on SPECT and PET images, enhancing diagnostic accuracy and efficiency. We develop a comprehensive framework that includes data acquisition and preprocessing, image enhancement.*

Our approach consists of two primary modules: data collection and image enhancement. In the data collection module, we compile and preprocess datasets from diverse clinical sources, ensuring consistency and robustness. The image enhancement module employs state-of-the-art deep learning models, including convolutional neural networks (CNNs) to denoise and improve the resolution of SPECT and PET scans. These enhancements aim to provide clearer and more detailed images, facilitating better visualization of anomalies such as tumors and metabolic activity.

This project lays the foundation for future developments in automated lesion detection and disease classification, contributing to more accurate diagnostics and improved patient outcomes in clinical practice..

Keywords: Convolutional Neural Network, SPECT & PET Medical Imaging, Brain Tumour, Deep Learning