IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, June 2025
Impact Factor: 7.67

Brain Tumor Detection Using SPECT and PET Imaging

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Abstract: *Brain tumors present significant diagnostic challenges due to their heterogeneous nature and complex biological behavior. Nuclear medicine imaging techniques, specifically Single Photon Emission Computed Tomography (SPECT) and Positron Emission Tomography (PET), have become integral in the evaluation of brain tumors. These modalities provide functional and molecular imaging capabilities that complement traditional anatomical imaging methods like MRI and CT. In this Project we proposed a Brain Tumor Detection model that utilizes SPECT and PET imaging data combined with Deep Learning techniques. The process involves data preprocessing, feature extraction, and training classification model to distinguish between tumor and non-tumor brain scans. The system was evaluated using standard performance metrices such as accuracy, precision, recall and F1-score.The result demonstrates that functional imaging of an scans and results the Brain Tumor Scans in Probabilities of various stages in the Brain Tumor Detection Model with the accuracy of 98%.*

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

DOI: 10.48175/IJARSCT-28131