Cancer Detection Model

AI/ML Based

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**Related Work:**

The detection of tumors in medical imaging, particularly using MRI scans, has been a significant area of research in the application of artificial intelligence. Several studies have employed deep learning techniques, such as convolutional neural networks (CNNs), to detect and classify tumors in both brain and breast MRI scans. For instance, Le et al. (2017) demonstrated the use of CNNs for early detection of brain tumors, achieving high accuracy in distinguishing between tumor and non-tumor regions. Similarly, for breast cancer detection, studies like those by Tajbakhsh et al. (2019) have explored various CNN architectures to improve diagnostic accuracy and reduce false positives. Additionally, machine learning methods, including fuzzy clustering and hybrid models, have been utilized for tumor segmentation, enhancing the precision of boundaries between healthy and abnormal tissues. Despite significant progress, challenges remain, especially regarding dataset variability, small sample sizes, and the generalization of models across different patient populations. This project builds on these techniques to improve early tumor detection in both brain and breast MRI scans, with an emphasis on achieving robust performance using limited datasets.

**Resources used(links):**

[Train Image Recognition AI with 5 lines of code | by Moses Olafenwa | Towards Data Science](https://towardsdatascience.com/train-image-recognition-ai-with-5-lines-of-code-8ed0bdd8d9ba)

[Pouya-Sameni/Video\_Object\_FaceDetection\_Custom: CHECKOUT MY VIDEO DEMONSTRATION IN README FILE FOR CUSTOM FACE RECOGNITION](https://github.com/Pouya-Sameni/Video_Object_FaceDetection_Custom)

[jenspetersen/probabilistic-unet: A PyTorch implementation of the Probabilistic U-Net, applied to probabilistic glioma growth](https://github.com/jenspetersen/probabilistic-unet)

[AFAgarap/wisconsin-breast-cancer: [ICMLSC 2018] On Breast Cancer Detection: An Application of Machine Learning Algorithms on the Wisconsin Diagnostic Dataset](https://github.com/AFAgarap/wisconsin-breast-cancer)

[Shilpi75/Breast-Cancer-Prediction: Breast Cancer Prediction using fuzzy clustering and classification](https://github.com/Shilpi75/Breast-Cancer-Prediction)

[mathewyang/Wisconsin-Breast-Cancer: Classifying Breast Cancer Tumors](https://github.com/mathewyang/Wisconsin-Breast-Cancer)

[Deep-Neural-Networks-HealthCare/Project 2 -- SurvNet -- Cancer Clinical Outcomes Predictor at master · prasadseemakurthi/Deep-Neural-Networks-HealthCare](https://github.com/prasadseemakurthi/Deep-Neural-Networks-HealthCare/tree/master/Project%202%20--%20SurvNet%20--%20%20Cancer%20Clinical%20Outcomes%20Predictor)

hamzahabib47/brain-cancer-detection-mri-images

My project aims to enhance early-stage cancer detection through a comprehensive approach that leverages various techniques. I analyse MRI scans of the breast and brain to identify tumours using machine learning. The techniques involved in this project include:

* Fuzzy clustering
* Image segmentation
* Convolutional Neural Networks (CNNs)
* Support Vector Machines (SVM)
* Feature extraction methods
* Decision trees
* Random forests
* Principal Component Analysis (PCA)

This combination of methods seeks to improve diagnostic accuracy and contribute to better patient outcomes.