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(57) Abstract :
Artificial Intelligence based Prevention and prediction of Early-stage Breast cancer by Analysis of Mammogram Images using Machine Learning, Image Segmentation and Deep learning algorithms Abstract: Cancer remains a prevalent ailment in contemporary life. Breast cancer has emerged as the predominant form of cancer affecting women globally, surpassing other malignancies in terms of prevalence. The increasing incidence of breast cancer among women across different socioeconomic backgrounds can be attributed to a combination of genetic factors, lifestyle choices, and environmental influences. Hence, the implementation of thorough screening protocols for timely detection and intervention emerges as a pivotal element in combating the ailment. The proliferation of artificial intelligence (AI) has brought about significant transformations across several domains, owing to its wide range of applications. The integration of artificial intelligence (AI) into the current screening process enhances the ease and convenience of receiving findings. One of the advantages of utilising artificial intelligence (AI) techniques in breast cancer screening is the ability to obtain findings with increased speed and accuracy. However, the integration of artificial intelligence (AI) poses numerous obstacles that must be methodically addressed. Given the significant prevalence of breast cancer in contemporary society, it is imperative for individuals to exercise vigilance and take necessary precautions. The prognosis for those with an early diagnosis of breast cancer is more favourable due to the prompt initiation of treatment. Patients have the ability to prevent the administration of unneeded medical interventions, such as when physicians accurately categorise benign tumours at the initial assessment. Extensive study has been undertaken to ascertain the accurate diagnosis and categorization of breast cancer. Furthermore, it is advantageous to ascertain the presence or absence of malignancy in a patient. Machine learning (ML) has emerged as the predominant approach for the classification and prediction of breast cancer (BC) patterns, owing to its unparalleled capacity to identify and analyse crucial characteristics inside intricate BC datasets. Classification and data mining technologies can potentially yield benefits for anyone involved in the organisation and categorization of data. In the medical domain, these methodologies are commonly employed to investigate phenomena and draw inferences. The formation of malignant, cancerous masses in the breast tissue leads to the dissemination of cancer. Medical professionals have the potential to erroneously classify a non-malignant tumour as malignant, leading to a misdiagnosis. The existence of breast cancer detection systems is crucial. Incorporation of machine learning (ML) techniques is crucial for the development of computer-aided detection (CAD) systems. The prognosis for breast cancer patients has significantly improved with early detection, primarily due to advancements in treatment modalities. In order to optimise their efficacy, it is advisable to employ dimension reduction and machine learning in tandem. The detection of breast cancer is accomplished through the utilisation of the Support Vector Machine method.

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