Title :

“ Enhancing Colorectal Cancer Detection with Ensemble Deep Learning and Vision Transformer Integration ”

Abstract :

Colorectal cancer poses a significant global health challenge, highlighting the need for more efficient detection methods. This research aims to enhance the accuracy and efficiency of colorectal cancer detection using a novel ensemble deep learning approach. Our methodology involves a multi-stage process starting with data preprocessing and initial feature extraction via fusion Convolutional Neural Networks (CNNs). The processed data is then analyzed using Vision Transformers (ViTs) to capture intricate patterns and spatial relationships within the imagery. Subsequently, the extracted features are refined with Bidirectional Long Short-Term Memory networks (Bi-LSTMs) to understand temporal dependencies. Finally, Support Vector Machines (SVMs) are employed for the ultimate prediction of cancerous tissues.

Preliminary results demonstrate a significant improvement in detection accuracy and processing efficiency compared to traditional methods. The integration of these advanced machine learning techniques promises a substantial contribution to early and accurate colorectal cancer diagnosis. By leveraging the strengths of CNNs for feature extraction, ViTs for spatial analysis, Bi-LSTMs for temporal understanding, and SVMs for precise classification, our approach enhances detection capabilities. This innovative ensemble method holds the potential to improve patient outcomes through timely intervention, thereby making a meaningful impact on colorectal cancer diagnosis and treatment.