

## ABSTRACT

Our project introduces a novel method to enhance the diagnosis of gastrointestinal bleeding using wireless capsule endoscopy (WCE) images. We utilize a hybrid CNN-LSTM module, combining Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks, to accurately classify WCE images as indicative of bleeding or normal conditions. Traditional manual inspection methods for WCE images are time-consuming and prone to errors. Our hybrid CNN-LSTM module offers an automated, real-time analysis solution. The CNN component extracts relevant features from WCE images, identifying critical visual patterns associated with bleeding or normal tissue, while the LSTM network captures temporal dependencies within sequences of images, providing a comprehensive understanding of the gastrointestinal tract's condition. In a real-time scenario, as the capsule traverses the digestive system, our hybrid CNN-LSTM module continuously analyzes images. Detected signs of bleeding prompt immediate alerts to healthcare providers, enabling timely intervention. Experimental results showcase the effectiveness of our approach, achieving high accuracy in classifying WCE images. By harnessing the strengths of CNNs and LSTMs, our method presents a promising solution for improving the diagnosis and management of gastrointestinal disorders using wireless capsule endoscopy.