Proposing a novel deep method for detection and localization of anatomical landmarks from the endoscopic video frames

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ABSTRACT

Early detection of gastrointestinal cancer remains a major challenge, particularly in identifying cancerous regions at their initial stages. Anatomical landmarks are crucial for guiding physicians during endoscopic screenings, with accurate localization enhancing diagnostic precision. This study proposes a deep learning approach using convolutional neural networks (CNNs) to detect and localize anatomical landmarks in endoscopic video frames from 40 patients at Firoozgar Hospital, Tehran. Pre-processed frames were annotated with bounding boxes to highlight regions of interest. The CNN model achieved 97.0% accuracy for landmark detection and classification and an MSE of 0.004 for bounding box regression, showing promise for assisting early diagnosis.

Keywords: Machine learning, Computer vision, Object Detection, Medical Image Analysis, Symptoms localization.

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