

Detection of cancerous changes in microscopic specimens from the colon

Contemporary medical diagnostics increasingly utilise advanced information technologies to analyse microscopic specimens, crucial in detecting and diagnosing cancerous changes. In our work, we focused on the analysis of microscopic specimens from the colon, which is extremely important in detecting early stages of cancer. We used Python to process and analyse these images, offering extensive image processing and machine-learning capabilities. Our approach did not use direct image segmentation but decided to divide the Whole Slide Images (WSI) into smaller sections of 256x256 pixels. This process allowed for effective management and analysis of large datasets characterised by high resolution and significant size, enabling focus on more detailed analysis of specific tissue areas and efficient model training. Subsequently, we developed a Support Vector Machine (SVM) –constructed and trained in Python to categorise image slices exhibiting cancerous changes or healthy tissue. Thanks to its ability to efficiently handle high-dimensional data spaces and generalisation capability, this model proved to be exceptionally effective in distinguishing areas of interest. Using machine learning techniques, including the SVM model, combined with an innovative approach to processing Whole Slide Images, opens new perspectives in precise oncological diagnostics, allowing for faster and more accurate identification of cancerous changes, which is crucial for treatment effectiveness and improving patient prognosis.

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