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Principle Component Analysis on Colon Cancer Detection

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Abstract : Colon cancer or colorectal cancer is a type of cancer that attacks the last part of the human digestive system. Lymphoma and carcinoma are types of cancer that attack human's colon. Colon cancer causes deaths about half a million people every year. In Indonesia, colon cancer is the third largest cancer case for women and second in men. Unhealthy lifestyles such as minimum consumption of fiber, rarely exercising and lack of awareness for early detection are factors that cause high cases of colon cancer. The aim of this project is to produce a system that can detect and classify images into type of colon cancer lymphoma, carcinoma, or normal. The designed system used 198 data colon cancer tissue pathology, consist of 66 images for Lymphoma cancer, 66 images for carcinoma cancer and 66 for normal / healthy colon condition. This system will classify colon cancer starting from image preprocessing, feature extraction using Principal Component Analysis (PCA) and classification using K-Nearest Neighbor (K-NN) method. Several stages in preprocessing are resize, convert RGB image to grayscale, edge detection and last, histogram equalization. Tests will be done by trying some K-NN input parameter setting. The result of this project is an image processing system that can detect and classify the type of colon cancer with high accuracy and low computation time.

Keywords : carcinoma, colorectal cancer, k-nearest neighbor, lymphoma, principle component analysis
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