

## Abstract

*Colorectal cancer is the growth of cancer cells which are in colon or above of anus(rectum) area. Several types of adenocarcinoma cancer such as carcinoma and lymphoma are often encountered in the medical. This is become one of the concern introduction of cancer colon type needing to treat cancer cases.*

*Some of benefits from colorectal cancer detection are prevent cancer patients from higher stage cancer because it is early detected, become simulation tool to facilitate the prospective medical experts in recognizing patterns of colorectal cancer types, support the medical experts to diagnose cancer when preparing for surgery further. Thus, the detection of colorectal cancer tends to assist the medical experts to be able to diagnose the disease quickly and accurately.*

*In this final project, Contourlet Transform (CT) is applied to detect colorectal cancer. CT has advantages to capture smoothing arch contours of cancer cells when the process of feature extraction. After that, GLCM statistical calculations were made to captures the spatial relationship between two points in a texture pattern. Furthermore, multiclass Support Vector Machine (SVM) was used to classify data. SVM is a supervised learning which only needs to generate once training and it belongs to optimal global solution.<sup>[11]</sup>*

*By using this methods, the system can recognize into 3 classes from 198 total data for 150 training data with the highest accuracy reach 100% and 48 testing data which the highest accuracy reach 75%, whereas it can recognize into 2 classes for 80 training data with the highest accuracy reach 100% and 40 testing data which the highest accuracy reach 97,5%.*

*Achievement of the highest accuracy was obtained by using the best parameters of Contourlet Transform, GLCM and SVM. There are subband at level 2 for contourlet coefficients with 9/7 and pkva filter. It also has used GLCM combination parameters such as Mean, Variance, Entropy, Kurtosis, Skewness, Angular Second Moment, Contrast, Correlation, and Inverse Difference Moment. In this final project using SVM kernel such as Linear, RBF, Quadratic, and polynomial properly with the needs of distribution data. It has C parameter which is multiple of 10 from range between 0 and 300. C parameter is a constant value to tolerate data when it is separated by hyperplane to minimize error classification.*

*Keywords: Colorectal cancer, pathology, contourlet transform, GLCM, multiclass SVM*