

ABSTRACT

Breast cancer is grown from malignant tumor which is found in the breast tissue. Whereas, the cancer stages is a condition that comes from doctor's examination when they diagnose how far the cancer has spread in the patient's body. The most common way to determine cancer stages is using TNM system classification that recommended by UICC/AJCC. There are three factors that estimated in the TNM system, which are the "T" factor or tumor size, the "N" factor or nodes (the regional lymph), and the "M" factor or metastasis (tumor has spread to another part of body).

The other research that have done before, extend far enough until the detection and classification of tumor viciousness. The LVQ ANN, Gabor Wavelet Filter, also combination of morphological gradient and watershed transformation are some methods that have used in the cancer detection system. Whereas, in this final project, the research will enhance to determine breast cancer stages from TNM factor (tumor size, nodes, metastasis).

To analyze the "T" factor (tumor size), mammogram used as input image. This input image will pass through segmentation process that use region growing method. The output segmentation will used to determine tumor's diameter. In the other hand, to analyze the "N" factor the system will provide questions list directed to examine the tumor spread to the lymph nodes. And last, to examine the "M" factor, chest x-ray used as input image using livewire segmentation method. The number of data that used as input image are 30 mammogram images and 30 chest x-ray images. From system examination process, the accuracy rate is 86.67% and the error rate is 13.33%. Total time computation in "T" factor system is 2.13-2.94 s per mammogram image. In "N" factor system, user is given 60 s time to answer the questions. And total time computation in "M" factor system is 120.56-120.85 s per chest x-ray image, where user is given 60 s time in segmentation and threshold arrangement process.

Key word: breast cancer, cancer stages, TNM, region growing, livewire