

IMAGE ANALYSIS AND FEATURE EXTRACTION BASED ON COLORECTAL CANCER HISTOLOGY

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ABSTRACT

Image-based artificial intelligence and deep learning has shown its expert-level of accuracy with an increasing rate of researchers in the medical field domain on solving various classification problems. As we all know, cancer is something that should be avoided before its spread. Since that, premature diagnosis could affect positively, and time is an essential component for a way of elimination vice versa.

After the emergence of a patient to the doctor, if the doctor assumes that the symptoms are associated with a cancer, to test this, the patient requires to go through a biopsy test which is one of the mandatory ways of verification on the related issue. This could be the usual way of analyzing a cancer. However, with the research investigations it showed that in Sri Lanka it will take 12 to 14 days to get the results of the given biopsy. What this test does is that a sample of tissue taken from the body of the patient that the doctor might need to inspect will be examined more closely. These tissues will be analyzed with a microscopic anatomy where histology comes into play. Using the histology, the spread of tissue variations will be analyzed. Depending on the results, the patient might have to go under special treatments as soon as possible. In this study, the author mainly focused on developing a Convolutional neural network on analyzing and identifying tissue variations of different given histology resolutions. This included a training model of classification on identified 8 tissue types that could present on a given histology, a classification mechanism of classifying microscopic anatomy which is a digital pathology.

With all the considerations mentioned above, it was proven that the requirement of such a system is essential in gaining predictions for a country like Sri Lanka. For a disease like cancer, even one day is important for a patient who diagnoses a carcinoma, and the treatments should take place then and there.

Keywords : Computational and Artificial Intelligence, Machine learning, Deep learning, Neural networks, Convolutional neural networks.