Abstract

Red blood (Erythrocite) is a major component in the human body that carries oxygen and substances that are useful to the body. The erythrocyte analysis can be done by calculating Red Blood Cell, examining Hb levels, as well as blood pressure. Calculation of the amount of Red Blood Cell can be used to indicate the condition of Haematuria. Haematuria is one of the abnormalities of Red Blood Cell, ie the amount of Red Blood Cell in the urine is more than it should be. In some previous studies, many digital image processing techniques have been developed for Red Blood Cell detection using some edge detection algorithms such as Canny, Sobel X, and Sobel Y. However, there has been no literature study on the analysis of edge detection algorithms for haematuria detection. The current haematuria detection system is expensive because it is based on textit light sensor. There is also no performance analysis of edge detection algorithms in haematuria. To handle this, then in this thesis the authors will conduct a literature study to select the edge detection algorithm with the best accuracy. The study was conducted by testing the algorithm on a prototype developed in Python. The prototype also usesInternet of Things to send image data from client to server. The method used in this Final Project is to take the image using microscope and dinolite. Next process the digital image data in raspberry pi and then sent to the server. The server will perform an erythrocyte image test for erythrocyte count in urine. The prototype test results show that the best edge detection algorithm for Hematuria detection is the Canny Algorithm. The algorithm is 5 % more accurate than the Sobel Y algorithm and 2.77 % more accurate than Sobel Y. But for Specificity Canny is 20% lower than Sobel X, but 2% larger than Sobel Y. While from Canny Sensitivity is 10% lower than Sobel Y and 20% greater than Sobel X.

Keywords: Red Blood Cell, Hematuria, Image Processing, Internet of Things.