

ABSTRACT

Thalassemia is a genetic condition which there is lack or reduced normal production of hemoglobin in red blood cells. Reduced production of hemoglobin is due to mutation inside hemoglobin proteins. Hemoglobin can be destroyed quickly in blood that causes lack of hemoglobin in red blood cells. Thalassemia causes sufferers to experience symptoms of anemia, like easily tired, pale skin, and breathing difficulty. Without an expert treatment, thalassemia can be fatal for heart and causes bone structure changes. Early monitoring is needed, which detecting hemoglobin levels. Generally, hemoglobin detection done invasively by taking a blood sample to check the hemoglobin levels in laboratory. This is considered uncomfortable if the test is carried out on children, especially repeatedly. Non – invasive hemoglobin detection test is needed so that it does not cause fear and trauma to children with thalassemia.

Based on these problems, in this final task was conducted research in the form of making hemoglobin detection system in a non-invasive way with digital image processing, especially in children of thalassemia patients. Through the image of the eye conjunctiva and image of the tongue of the thalassemia patient, digital image processing is done manually cropping so as to produce a focused area to find the equation of regression. This regression equation is used to predict the hemoglobin value of thalassemia patients based on the value of red color components in the eye conjunctiva image and tongue.

The results of system testing in this final project have an average precision level of 59% and a 100% percentage level of accuracy with manual cropping in digital conjunctiva image processing of children with thalassemia.

Keywords: Thalassemia, Non-invasive, Hemoglobin, Eye Conjunctiva, Tongue Image, Manual Cropping.