

ABSTRACT

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This research is a part of the soft tissue fruit harvesting robot hand project currently being developed at Mie university. The main purpose of this thesis is to improve the robot hand's visual system to recognize a round shape fruit partially hidden by a leaf. In this system, the robot hand uses two color-CCD cameras as its visual sensor. Many properties required for harvesting such as a fruit position and a skin color have been studied. These properties are important in predicting fruit's ripeness and separating a fruit image from the background image obtained from the CCDs. From this partially hidden fruit image, a simple algorithm to determine the whole shape of fruit is presented. The proposed method locates three different points on fruit edge and from these data the center and radius of the fruit can be determined. To verify the proposed algorithm, many experiments have been performed in a laboratory using model fruits. It is found that the proposed algorithm yields satisfactory result when a hidden portion is not larger than the real fruit's radius.