A NEW COMPUTERIZED AND AUTOMATED GRADING SYSTEM FOR FRESH FRUIT BUNCHES (FFB) IN PALM OIL MILL

BY:

AHMED JAFFAR
ROSELEENA JAAFAR
NURSURIATI JAMIL
BULAN ABDULLAH

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PROJECT TEAM MEMBERS

PROFESSOR IR DR AHMED JAFFAR
Project Leader

Signature

PN ROSELEENA JAAFAR
Project Member

Signature

ASSOCIATE PROFESSOR DR NURSURIATI JAMIL
Project Member

Signature

PN BULAN ABDULLAH
Project Member

Signature

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1.1 RESEARCH BACKGROUND

Malaysia is not the only the world's leading producer and exporter of palm oil but also the biggest exporter of oils and fats in the world. In keeping its status as world leader in production of quality palm oil, a lot of research has been done in order to produce palm oil species that can produce higher Oil Extraction Rate (OER). At the moment, the highest oil extraction rate that can be produced in palm oil fruit is about 25 percent [1]. Oil extraction rate is very important to the palm oil mill because it represents their production performance. Higher oil extraction rate with less amount of Fresh Fruit Bunches (FFB) processed is what palm oil millers aimed to achieve. The oil content in ripe palm oil fruits is higher than that of unripe palm oil fruits.

Since the main factor contributing to the maximization of oil extraction rate on the palm oil fruits is on the degree of ripeness, a proper grading system should be developed to assist the palm oil millers. Currently, the fruits are randomly selected on a basis of 50 bunches for a consignment of 5 tons and 100 bunches for a consignment for more than 5 tons. Depending on the ripeness, the fruits are either graded as ripe or unripe. Fruits that are unripe will be deducted from the gross tonnage of FFB supplied to the mill. The normal practice in grading FFB at palm oil mill is done by the mill operators through visual inspection (manual grading) and this is extremely tedious and time consuming which is prone to errors or inconsistencies in the grading results.

Thus, modifying and redesigning the manual grading process to become automated by introducing a machine vision system [2, 3] which uses web camera to capture the images of the fruits and then processed to recognize the degree of ripeness of FFB will be the scope of this research project. Hopefully, this would help to increase the oil extraction rate, quality and productivity of palm oil production.

1.2 RELATED RESEARCH

Currently, all palm oil fruit quality is graded manually. This method has some disadvantages that leads to inaccuracies and has strong bias towards the mills. Many researches have conducted investigation on the correlation between oil content in the