

**UNIVERSITI TEKNOLOGI MARA  
CAWANGAN PULAU PINANG**

**IDENTIFICATION AND COUNTING  
OF BROWN PLANTHOPPER IN THE  
PADDY FIELD USING IMAGE  
PROCESSING TECHNIQUES**

**NUR ATIQAH BINTI NASSER SHAH**

**Faculty of Electrical Engineering**

Jan 2018

## AUTHOR'S DECLARATION

I declare that the work in the thesis was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the results if my own, unless otherwise indicated or acknowledge as a reference work.

I, hereby acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student : Nur Atiqah Binti Nasser Shah

Student I.D. No. : 2014172173

Programme : Bachelor of Engineering (Hons) Electrical and  
Electronic Engineering

Faculty : Faculty of Electrical Engineering

Thesis : Identification and Counting of Brown Planthopper in  
Paddy Field Using Image Processing Techniques

Signature of Student : .....

Date : Jan 2018

# TABLE OF CONTENTS

<b>CHAPTER</b>	<b>TITLE</b>	<b>PAGE</b>
	<b>AUTHOR'S DECLARATION</b>	i
	<b>ABSTRACT</b>	ii
	<b>ACKNOWLEDGEMENT</b>	iii
	<b>TABLE OF CONTENTS</b>	iv
	<b>LIST OF TABLE</b>	vii
	<b>LIST OF FIGURES</b>	viii
	<b>LIST OF SYMBOLS</b>	ix
	<b>LIST OF ABBREVIATIONS</b>	x
<b>1</b>	<b>INTRODUCTION</b>	1
	1.1 Overview	1
	1.2 Research Background	1
	1.3 Problem Statement	3
	1.4 Objectives	3
	1.5 Scope of Study	4
	1.6 The Relevancy of Project	4
	1.7 Thesis Outlines	4
<b>2</b>	<b>LITERATURE REVIEW</b>	6
	2.1 Overview	6
	2.2 Agriculture and Image Processing	6
	2.3 Improving Method For Paddy Growth	6
	2.4 Pest That Attack Paddy Crop	8
	2.5 Image Processing	9
	2.6 Application Of Image Processing	9
	2.7 Image Processing For Pest Detection	10
	2.8 Summary	11

<b>3</b>	<b>METHODOLOGY</b>	12
3.1	Overview	12
3.2	System Configuration	12
3.3	Image Acquisition	13
3.4	Image Processing	14
	3.4.1 Colour Model Conversion	14
	3.4.2 Image Segmentation	15
	3.4.3 Removing Small Area	18
	3.4.4 Binary Morphology	20
3.5	Feature Extraction	22
3.6	Detection	23
	3.6.1 K-Nearest Neighbor (Knn)	23
	3.6.2 Decision Tree	24
	3.6.3 Counting Process	25
3.7	Performance Evaluation	25
3.8	Summary	27
<b>4</b>	<b>RESULTS AND DISCUSSION</b>	28
4.1	Overview	28
4.2	Image Acquisition	28
4.3	Image Processing	29
	4.3.1 Segmentation Using K-Means Clustering	29
	4.3.2 Removing Noise And Small Region	30
4.4	Detection	31
4.5	Performance Evaluation	33
4.6	Conclusion	34
<b>5</b>	<b>CONCLUSION AND RECOMENDATION</b>	
5.1	Overview	35
5.2	Conclusion	35
5.3	Future Work Recommendation	36

## ABSTRACT

Massive paddy crops is lost every year, due to weather condition, plant disease and pest attack. Pest attack is among the main threat that reducing the quality and quantity of the paddy crops. Pesticide is used to control and eliminate the pest in paddy field. In order to determine the quantity of pesticide used, traditional method is based on manual counting where sticky trap is used to trap the pest and after that the pest was counted manually. However this method is tedious and time consuming due to many crops generally found in paddy field. This can lead to imprecise counting through the process and delay in order to gain the accurate count. This paper proposed an image processing technique and artificial intelligent as an alternate method for identification and counting of pests. The suggested pest detection consist of four (4) consecutive steps; image acquisition, image segmentation, feature extraction and detection. The detection step contains two processes that are classification and counting of pest. A k-nearest neighbour (kNN) classifier is used in this step. The process is developed and implemented using MATLAB. Simulation results using 10 pest images indicated that the classification performance of brown planthopper using kNN provides better performance compared to decision tree. The kNN achieved precision 0.97, recall 0.96, accuracy 0.97 and F score 0.96. The system will be used in assisting paddy field worker to predict the type and amount of pesticide to be used for the pest control.

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