

UNIVERSITI TEKNOLOGI MARA

**FAULTY DETECTION ON
BROADCASTING EQUIPMENT
USING THERMAL INFRARED
IMAGING APPROACH**

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ABSTRACT

Thermal infrared is a non-invasive method for sensing temperature on specific time frame of its region of interest. It had been widely used as faulty detection on many applications including electrical transmission grid and electronics board. Broadcasting equipment operates 24-hours per day and yet sensing the faulty on fully functional equipment requires a non-invasive method. Broadcasting equipment separated into two; studio site and transmission site. Radio broadcasting equipment in studio sites has five main stages. This research has focused on the equipment inside the on-air studio. The broadcasting equipment in the studio is further classified into several section and sub-section. Acquiring thermal infrared images requires image processing method. Since the thermal infrared camera captures thermal images in grey-scale images, it must be converted into pseudo-coloured images for hot spot detection. Before conversion take place, raw thermal images must be processed for a noise cancellation process called histogram equalization method. This method used to adjust the histogram level of thermal images to enhance its quality. These converted pseudo-coloured thermal images then processed in image segmentation method. The thermal images separated and segregated into its own cluster based on the L*a*b colour space. This segmentation applies to differentiate the focus point from the whole images to ease the faulty detection. This study presents various method of image segmentation for pseudo-coloured thermal images. Based on the result, it is shown that k-means clustering had given the best evaluation measurement of PSNR, MSE and SSIM compared with fuzzy c-means clustering. This image processing method performed in MATLAB R2015a software and average time to execute is less than 1 seconds.

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TABLE OF CONTENTS

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	xii
CHAPTER ONE: INTRODUCTION	
1.1 Research Background	1
1.2 Problem Statement	6
1.3 Objectives	6
1.4 Scope of Research	7
1.5 Significance of Research	7
CHAPTER TWO: LITERATURE REVIEW	
2.1 Introduction	8
2.2 Radio Broadcasting System	8
2.3 Thermal Infrared Imaging	13
2.3.1 Thermal Infrared System Approach	16
2.4 Image Processing Method for Thermogram	17
2.4.1 Image Enhancement using Histogram Equalization	18
2.4.2 Image Segmentation	21
2.5 Hardware Setup for Thermal Infrared Image Acquisition	27
2.5.1 A Micro-controller Approaches	27
2.5.2 Available Portable Thermal Infrared Camera	30
2.6 MATLAB R2015a Image Processing Software	32

CHAPTER THREE: METHODOLOGY

3.1	Introduction	33
3.2	Flowchart of Proposed Method	33
3.2.1	Image Acquisition	34
3.2.2	The Implementation of Histogram Equalization	35
3.2.3	Image Conversion to Pseudo-coloured Image	38
3.2.4	The Implementation of Image Clustering	39
3.3	Performance Analysis	45
3.3.1	PSNR and MSE	46
3.3.2	SSIM	46

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1	Introduction	48
4.2	Results from Image Processing Method	48
4.3	Performance Analysis Results	58
4.4	Discussions	61

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

REFERENCES	64
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APPENDICES	72
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AUTHOR'S PROFILE	80
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