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IN-CAR-ABANDONED CHILDREN'S BODY TEMPERATURE
DETECTION BASED ON THERMAL IMAGING USING DEEP
LEARNING APPROACHES

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SCHOOL OF GEOMATICS SCIENCE AND NATURAL RESOURCES
COLLEGE OF BUILT ENVIRONMENT
UNIVERSITI TEKNOLOGI MARA MALAYSIA

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**Thesis submitted to the Universiti Teknologi MARA Malaysia
in partial fulfilment for the award of the degree of the
Bachelor of Surveying Science and Geomatics (Honours)**

JULY 2024

DECLARATION

I declare that the work on this project/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA (UiTM). This project/dissertation is original and it is the result of my work, unless otherwise indicated or acknowledged as referenced work.

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ABSTRACT

The term “In-Car-Abandoned Children” refers to children left unsupervised in vehicles. The number of child deaths due to being trapped inside vehicles is increasing every day. Recent technology has introduced many sensors for detecting in-car-abandoned children, primarily focusing on image and sound detection, which can be inaccurate. This study proposes a sensor based on thermal body of children an adding detection element to improve accuracy. The child's body temperatures will be classified using deep learning approaches, specifically employing Python for data acquisition and system refinement. The tuned Python model aims to achieve optimal results. The findings demonstrate the efficacy of the proposed deep learning model, specifically the MobileNet V2 model, achieving remarkable classification accuracies: 97% for compact cars, 95% for MPVs, and 93% for sedans. These results underscore the model's capability in accurately identifying children abandoned in vehicles using thermal images. The optimized models significantly enhanced accuracy, reinforcing the model's reliability across various car types. This study is significant due to its demonstrated accuracy and stability in detecting children in vehicles. By proposing an alternative method for identifying abandoned children in cars using both low-quality and high-quality thermal images, this research provides a valuable tool for authorities. It offers a practical solution to mitigate the risks associated with child heatstroke in vehicles. Ultimately, the successful implementation of this model has the potential to substantially reduce the incidence of child abandonment in cars and promote safer transportation practices for children. This research supports authorities, particularly the Ministry of Transportation, in risk mitigation. Successful implementation could reduce child abandonment and promote safer child transportation.

Keywords: **in-car-abandoned children, vehicle, thermal images, sensor, deep learning**

CHAPTER	TITLE	PAGE
	CONFIRMATION BY PANEL OF EXAMINERS	ii
	DECLARATION	iii
	ABSTRACT	iv
	ACKNOWLEDGEMENT	v
	TABLE OF CONTENT	vi
	LIST OF FIGURES	x
	LIST OF TABLES	xii
	LIST OF ABBREVIATIONS	xiv
1	INTRODUCTION	
	1.1 Background study	1
	1.2 Problem statement	4
	1.3 Aim and objectives	5
	1.4 Research question	5
	1.5 General methodology	6
	1.6 Scope and limitation of the study	6
	1.6.1 Study area	6
	1.6.2 Software used	7
	1.7 Significance of study	8
	1.8 Thesis outline	8
2	LITERATURE REVIEW	
	2.1 Introduction	9
	2.1.1 Introduction to In-Car-Abandoned Children.	10
	2.1.2 Health Effect of In-Car-Abandoned Children	10
	2.1.3 Factors of In-Car-Abandoned Children	11
	2.1.4 Body Temperature Measurement Method	12
	2.1.5 Method of Positioning Thermal Device	13
	Determination In-Car-Abandoned Children	