

UNIVERSITI TEKNOLOGI MARA

PORTABLE AIR POLLTION METER

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ABSTRACT

Airborne pollutants and dangerous chemicals are common in highly industrialized urban environments. These contaminants have the potential to seriously harm people's health by causing both acute and long-term conditions like heart disease, lung cancer, and respiratory infections. Not only does air pollution monitoring inform the public about the health risks associated with air pollutants, but it also helps legislators draft laws and regulations aimed at reducing those risks. As a result, the solution provides a portable air pollution meter which produces with using Arduino UNO, LCD display, MICS-6814 air quality sensor, BME 280 environmental sensor and Wifi module. The system will provide user data of air condition by detecting the humidity, temperature and pressure of the air using environmental sensor. It is also will provide readings of nitrogen dioxide(NO₂) and carbon monoxide(CO₂) to the user. This technology not only provide the data to the user but also can raise the user awareness about the polluted area. This will reduce the risks of the health by getting infected with any disease. It is a practical approach to reduce the chances of getting infected by diseases. The objectives of this project is to provide the air pollution meter that will monitor the air condition within small area by providing the data to the user. To summarise, this monitoring system will provide useful data to user and raise awareness about the danger of polluted air.

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TABLE OF CONTENT

	Page
AUTHOR'S DECLARATION	iii
APPROVAL	iv
ABSTRACT	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENT	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF SYMBOLS	xi
LIST OF ABBREVIATIONS	xii
CHAPTER ONE : INTRODUCTION	1
1.1 Introduction	1
1.2 Background Study	2
1.3 Problem Statement	3
1.4 Objectives	4
1.5 Scope of Study	4
1.6 Project Contribution	5
CHAPTER TWO : LITERATURE REVIEW	6
2.1 Introduction	6
2.2 Related Project	6
CHAPTER THREE : METHODOLOGY	11
3.1 Introduction	11
3.2 Methodology Flow Chart	12
3.3 Hardware	14
3.4 Software	13

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Urban environments with a high degree of industrialization are infested with hazardous chemicals and airborne pollutants. These pollutants can have devastating effects on human health, causing both acute and chronic diseases such as respiratory infections, lung cancer, and heart disease.

Air pollution monitoring is vital not only to citizens, warning them on the health risks of air pollutants, but also to policy-makers, assisting them on drafting regulations and laws that aim at minimizing those health risks. Currently, air pollution monitoring predominantly relies on expensive high-end static sensor stations. These stations produce only aggregated information about air pollutants, and are unable to capture variations in individual's air pollution exposure.

As an alternative, this develops a citizen-based air pollution monitoring system that captures individual exposure levels to air pollutants during daily indoor and outdoor activities. We present a low-cost portable sensor and carry out a measurement campaign using the sensors to demonstrate the validity and benefits of citizen-based pollution measurements. Specifically, the system successfully classifies the data into indoor and outdoor, and validates the consistency and accuracy of our outdoor-classified data to the measurements of a high-end reference monitoring station. Our experimental results further prove the effectiveness of our campaign by providing fine-grained air pollution insights over a wide geographical area, identifying probable causes of air pollution dependent on the area, and providing citizens with personalized insights about air pollutants in their daily commute.