

## TITLE OF UNDERGRADUATE THESIS

## **UNDERGRADUATE THESIS**

# Submitted As One Of The Requirements To Obtain Sarjana Teknologi Informasi

By: ENRICO ISYA SAVARA

001201800007

FACULTY OF COMPUTING
CIT STUDY PROGRAM

**CIKARANG** 

**JUNE, 2023** 

### PANEL OF EXAMINER APPROVAL

The Panel of Examiners declare that the undergraduate thesis entitled (Title/Bold) **HUMID DETECTION AND TEMPERATURE USING ARDUINO** that was submitted by Enrico Isya Savara majoring in Computer Science from the Information Technologywas assessed and approved to have passed the Oral Examination on June 26, 2023

#### **Panel of Examiner**

2

ROSALINA
Chair of Panel Examiner

GENTA SAHURI Examiner I

Abdul Ghofir S.Kom.,M.Kom. **Advisor** 

## HUMID DETECTION AND TEMPERATURE USING ARDUINO

Ву

## ENRICO ISYA SAVARA 001201800007

Approved:

Abdul Ghofir S.Kom., M.Kom. Thesis Advisor Cutifa Safitry,Ph.D Program Head of Information Technology

Rila Mandala, Ph.D Dean of Faculty of Computing

### STATEMENT OF ORIGINALITY

In my capacity as an active student at President University and as the author of the final project stated below:

Name : Enrico Isya Savara

Student ID number 001201800007

Study Program : Information Technology

Faculty : Computer Science

I hereby declare that my final project entitled "HUMID DETECTION AND TEMPERATURE USING ARDUINO" is to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism detected in this final project, I am willing to be personally responsible for the consequences of these acts of plagiarism and will accept the sanctions against these acts in accordance with the rules and policies of President University.

I also declare that this work, either in whole or in part, has not been submitted to another university to obtain a degree.

Cikarang, June, 2023

**ENRICO ISYA SAVARA** 

# SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

As an academic community member of the President's University, I, the undersigned:

Name : ENRICO ISYA SAVARA

Student ID number 001201800007

Study program : Information Technology

for the purpose of development of science and technology, certify, and approve to give President University a non-exclusive royalty-free right upon my final report with the title:

#### "HUMID DETECTION AND TEMPERATURE USING ARDUINO"

With this non-exclusive royalty-free right, President University is entitled to converse, to convert, to manage in a database, to maintain, and to publish my final report. There are to be done with the obligation from President University to mention my name as the copyright owner of my final report.

This statement I made in truth.

Cikarang, June, 2023

**ENRICO ISYA SAVARA** 

# ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

As an academic community member of the President's University, I, the undersigned:

Name : Abdul Ghofir

ID number : 2002090010

Study program : Information Technology

Faculty : Computing

declare that following thesis:

Title of thesis : **Humid Detection and Temperature Using Arduino** 

Thesis author : ENRICO ISYA SAVARA

Student ID number 001201800007

will be published in journal / institution's repository / proceeding / unpublished.

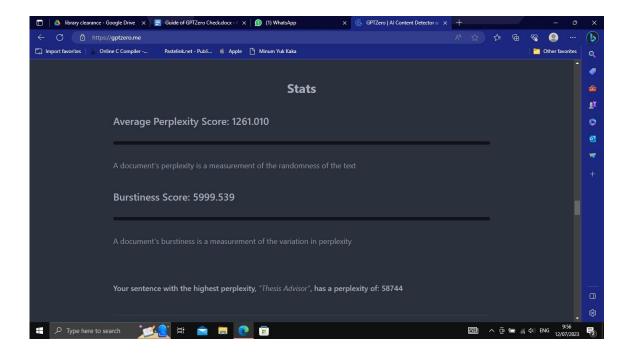
Cikarang, June, 2023

Abdul Ghofir

# PLAGIARISM CHECK RESULT

1 SIMIL	9% ARITY INDEX	14% INTERNET SOURCES	7% PUBLICATIONS	12% STUDENT PA	PERS
PRIMAR	y sources				
1	reposito	ry.president.ac	.id		3%
2	Submitte Student Paper	ed to President	University		2%
3		ed to Asia Pacif ogy and Innova	C.C. C.	ollege of	1 %
4	Submitte Student Paper	ed to Mississipp	oi State Univer	sity	1%
5	of Real- System Confere	rdiyanto. "Desi Fime Plant Proc in Organic Ferti nce Series: Mat ring, 2019	ess Control Me lizer Production	onitoring on", IOP	1 %
6	dspace.	daffodilvarsity.e	edu.bd:8080		1 %
7	Humidit	atif, Kuat Supriy y Observation S ntroller-Based I	system in ATm		1 %

# **GPTzero CHECK RESULT**



#### **ABSTRACT**

Air humidity is a measure of the amount of water vapor in the air. The development of electronic materials and fiber optics has supported the development of various types of air humidity sensors and measurement techniques. Air humidity measurement is very important in various industrial sectors such as the food processing and storage industry, agriculture, pharmaceuticals, biomedicine, chemicals, ecology, and monitoring of atmospheric weather conditions. Temperature, or air temperature, is a condition that is felt on the surface of the earth as hot, cool, or cold. The Earth's surface receives heat from solar radiation in the form of electromagnetic radiation. The radiation emitted from the sun does not entirely reach Earth's surface. This is because, when it enters the atmosphere, the rays of the sun experience reflection, scattering, and absorption by materials in the atmosphere. A minimal room temperature monitoring system is one of the fatal factors that can be dangerous, and remotely monitoring people can determine the temperature condition of a room without having to directly observe it.

## ACKNOWLEDGMENTS

I'd want to convey my heartfelt gratitude to everyone who have always been supportive of me as I worked on this final project:

- 1. I congratulate myself for working tirelessly on and completing this final project.
- 2. To my parents, who have always backed me up and prayed for me.
- 3. Mr. Abdul Ghofir, thank you so much for agreeing to be my final project advisor.
- 4. All of my lecturers who have provided me with information over the last few years, and I am really glad to have been a student of all of them.
- 5. For my friends and friends who always pray for me and support me in any situation, I express my gratitude.

## TABLE OF CONTENTS

			Page
ACK	NOWL	DGMENTS	)
LIST	OF TA	BLES	3
LIST	OF FIC	URES	1
CHAP	TER		
I.	INTRO	DUCTION	
	1.1	Background 1	
	1.2	Problem Statement	
	1.3	Objectives	
	1.4	Scope & Limitation	
	1.5	Final Project Methodology4	
		1.5.1 Literature Study Method4	
		1.5.2 Observation Method4	
		1.5.3 Analysis Method4	
	1.6	Final Project Outline6	
II.	LITERA	TURE STUDY	
	2.1	Microcontroller7	
	2.2	Arduino Uno7	
	2.3	Communication8	
		2.3.1 Inputs And Outputs9	
		2.3.2 Power Supply9	
		2.3.3 Memory9	
		2.3.4 Memory Bits9	
		2.3.5 Arduino Software10	
		2.3.6 Programming	
		2.3.7 Automatic Software Reset	
	2.4	Arduino IDE11	
	2.5	Sensor	
	2.6	Sensor DHT2213	
	2.7	RTC (Real Time Clock)	
	2.8	I2C (Inter Integrated Circuit)15	

	2.9	LCD (Li	iquid Crystal Digital)16	
CHAP	ΓER			
III.	SYSTEI	M ANALY	/SIS17	
	3.1	System	າ Overview17	
	3.2	Functio	on Analysis 17	
	3.3	Software and Hardware Requirement18		
	3.4	Use Case Diagram		
		Use Ca	ase Narrative20	
	3.6	Swim l	ane Diagram	
IV.	SYSTEI	M TESTIN	NG22	
	4.1	Testing	g Environment22	
	4.2	Testing	g Hardware23	
		4.2.1	Starting Arduino23	
		4.2.2	Main Screen24	
		4.2.3	Result From Temperature25	
		4.2.4	Result From Humidity	
		4.2.5	Shows Time and Date26	
	4.3	Har	dware Details2	7
		4.3.1	Library	
		4.3.2	Address	
		4.3.3	Sketch	
		4.3.4	Sensor DHT2229	
		4.3.5	RTC30	
		4.3.6	Delay	
		4.4	Testing Scenario	31
		4.5	Testing Accuracy Humid and Temperature Detection	33
V.	CONC	LUSION A	AND FUTURE WORKS34	
		5.1	Conclusion	34
		5.2	Future Works	34
		REEEREN	ICFS	36

# LIST OF TABLES

FIGURE		
3.1 Functional Analysis	19	
3.2 Use Case Narrative Arduino Uno		21
4.1 Testing Scenario		33

# LIST OF FIGURES

FIGURE		Page
2.1	Arduino Uno	8
2.2	Arduino Application IDE	11
2.3	Signal Conditioning Circuit	12
2.4 1Erro	Sensor DHT (DHT22)	
2.5	RTC (Real Time Clock)	14
2.6	LCD I2C	15
2.7	LCD	16
3.1	Use case diagram Temperature and Humidity	19
3.2	Swim Lane Diagram	21
4.1 2Erro	Starting Arduinoor! Bookmark not defined.	
4.2	The Main Screen	24
4.3	Showing Temperature	25
4.4	Showing Humidity	26
4.5	Showing Timr And Date	27
4.6	Libary	27
4.7	Addres	28
4.8	Skecth	29
4.9	Sensor	30
4.10	RTC	31
4.11	Delay	31