WEB APPLICATION GUITAR TUNING USING MACHINE LEARNING WITH ML5.JS

UNDERGRADUATE THESIS

Submitted as one of the requirements to obtain
Sarjana Komputer (S. Kom)

By

MUHAMMAD ABRAR ZAKIALMER
001201900058

FACULTY OF COMPUTER SCIENCE
INFORMATION TECHNOLOGY PROGRAM
CIKARANG
March 2023

PANEL OF EXAMINER APPROVAL

The Panel of Examiners declare that the undergraduate thesis entitled **Web Application Guitar Tuning Using Machine Learning with ml5.js**

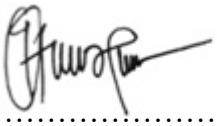
that was submitted by Muhammad Abrar Zakialmer majoring in Information Technology from the Computer Science was assessed and approved to have passed the Oral Examination on March 16th, 2023

Panel of Examiner

……

Genta Sahuri, M.Sc

Chair of Panel Examiner



……

Dr. Hasanul Fahmi, M.Kom

Examiner I

STATEMENT OF ORIGINALITY

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

Name : Muhammad Abrar Zakialmer

Student ID number : 00120190058

Study Program : Information Technology

Faculty : Computer Science

I hereby declare that my final project entitled "**Web Application Guitar Tuning Using Machine Learning with ml5.js**" 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, 2023

Muhammad Abrar Zakialmer

SCIENTIFIC PUBLICATION APPROVAL FOR ACADEMIC INTEREST

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

Name : Muhammad Abrar Zakialmer

Student ID number : 001201900058

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:

"Web Application Guitar Tuning Using Machine Learning with ml5.js"

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, 2023

Muhammad Abrar Zakialmer

ADVISOR APPROVAL FOR JOURNAL/INSTITUTION'S REPOSITORY

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

Name : Cutifa Safitri

NIDN : 20190900815

Study program : Information Technology

Faculty : Computing

declare that following thesis:

Title of Thesis : **Web Application Guitar Tuning Using Machine Learning with ml5.js**

Undergraduate Thesis author : Muhammad Abrar Zakialmer

Student ID number : 001201900058

will be published in ~~**journal**~~ **/ institution's repository /** ~~**proceeding**~~ **/** ~~**unpublished.**~~

Cikarang, 2023

Cutifa Safitri, Ph,D

SIMILARITY INDEX REPORT

Final Draft

ORIGINALITY REPORT

11%	10%	3%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	kids.britannica.com Internet Source	2%
2	Submitted to University of Pretoria Student Paper	1%
3	www.ijsrd.com Internet Source	1%
4	www.nti-audio.com Internet Source	1%
5	Submitted to University of Greenwich Student Paper	1%
6	Submitted to University of New Haven Student Paper	<1%
7	www.prepbytes.com Internet Source	<1%
8	intelliconnect-tech.com Internet Source	<1%
9	Submitted to Westcliff University Student Paper	<1%

SIMILARITY INDEX REPORT

Stats

Average Perplexity Score: 78.038

A document's perplexity is a measurement of the randomness of the text

Burstiness Score: 73.241

A document's burstiness is a measurement of the variation in perplexity

Your sentence with the highest perplexity, *"This chapter contains descriptions of Guitar Tuning, Machin Learning in ml5.js, Web Applications, Related Work, and Fast Fourier Tramsfprm Algorithms."*, **has a perplexity of: 303**

ABSTRACT

The field of machine learning has grown rapidly in recent years and is now widely used to identify patterns in data and make predictions or decisions. In today's fast-paced world, musicians are constantly looking for ways to improve their skills and performance. However, tuning a guitar can be a difficult and time-consuming task, depending on the musician's ears to detect the right note. With modern technology, machine learning algorithms can automate this process, simplifying guitar tuning. Tuning a guitar is a complex process of determining the frequencies of the strings and tuning them to the correct pitch. Standard, Alternate, and Custom Tuning are the three most popular guitar tuning styles, each with their own set of challenges. Using waterfall model method can be more precise to make this project come true. With help from ml5.js library this project can access the microphone and do pitch detection so this project will be running as expected. The result obtained from this study are creation of web-based application of tuning guitar by implement waterfall model method, Fast Fourier Transform Algorithm, anf ml5.js library. The name of this project will be “G-Tune”

DEDICATION

I dedicated this final project to Allah swt. And my family

ACKNOWLEDGEMENT

I would like to express my thanks and appreciation to those who supported and assisted me during the final project period. With great respect and respect, I would like to express my gratitude to:

1. Allah swt, for giving grace and gift, until I can finish this project to completion.
2. My family, that always support me when I struggle and stuck on this project, and thank you for your prayers
3. Myself, for wanting to work together and always being strong to face all mistakes
4. My support system, Rahma Amalia Amanda, who always cheer me up when I was sad or struggle to do this project.
5. My Bestfriend, Ida Ayu Mera Indiragani and Zaenur Ismail Widyatmoko. That supporting me with a lot of reference and cheer me up to graduate together.
6. Ms. Cutifa Safitri, Ph. D, as my final project advisor, who always guides me to be better and provides many suggestions and lessons that finally allowed me to complete this final project.
7. All lecture of Faculty of Computing, has given a lot of learning, from when I entered campus until now I have completed this project

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES