COMPARISON OF PIXEL-BASED AND OBJECT-BASED LAND USE LAND COVER CLASSIFICATION USING SATELLITE IMAGERY

BY

KADEK LOSINANDA PRAWIRA

NIM 2115101046

COMPUTER SCIENCE STUDY PROGRAM

DEPARTMENT OF INFORMATICS ENGINEERING

FACULTY OF ENGINEERING AND VOCATIONAL

UNIVERSITAS PENDIDIKAN GANESHA

SINGARAJA

2025


UNIVERSITAS PENDIDIKAN GANESHA
UNDIKSHA
UNIVERSITAS PENDIDIKAN GANESHA
UNDIKSHA

COMPARISON OF PIXEL-BASED AND OBJECT-BASED LAND USE LAND COVER CLASSIFICATION USING SATELLITE IMAGERY

UNDERGRADUATE THESIS

Submitted to
Universitas Pendidikan Ganesha
To fulfill one of the requirements in completing
Bachelor of Computer Science Program

By
Kadek Losinanda Prawira
NIM 2115101046

COMPUTER SCIENCE STUDY PROGRAM
DEPARTMENT OF INFORMATICS ENGINEERING
FACULTY OF ENGINEERING AND VOCATIONAL
UNIVERSITAS PENDIDIKAN GANESHA
SINGARAJA
2025

UNDERGRADUATE THESIS

SUBMITTED TO FULFILL THE REQUIREMENTS FOR THE COMPLETION OF ASSIGNMENTS AND TO MEET THE QUALIFICATIONS FOR OBTAINING A BACHELOR'S DEGREE IN COMPUTER SCIENCE

Approved by,

1st Advisor,	2nd Advisor,
Kadek Yota Ernanda Aryanto, S.Kom., M.T., Ph.D	Dr. Luh Joni Erawati Dewi, S.T., M.Pd.
NIP. 197803242005011001	NIP. 197606252001122001

This Undergraduate Thesis by Kadek Losinanda Prawira
defended before the examiner
on January 20, 2025

Board of Examiners,

Ir. Ketut Agus Seputra, S.ST.,M.T. (Chairperson)
NIP. 199008152019031018

I Nyoman Saputra Wahyu Wijaya, S.Kom., M.Cs. (Members)
NIP. 198910262019031004

Kadek Yota Ernanda Aryanto, S.Kom., M.T., Ph.D (Members)
NIP. 197803242005011001

Dr. Luh Joni Erawati Dewi, S.T., M.Pd. (Members)
NIP. 197606252001122001

Accepted by the Faculty of Engineering and Vocational Examination Committee
Universitas Pendidikan Ganesha
to fulfill the requirements for obtaining a Bachelor's degree in Computer Science

On:

Day : Kamis
Date : 30 JAN 2025

Acknowledged by,

Exam Chairman,

ıde Windu Antara Kesiman, S.T., M.Sc., Ph.D
P. 198211112008121001

Exam Secretary,

I Nyoman Saputra Wahyu Wijaya, S.Kom., M.Cs
NIP. 198910262019031004

Approved by
Dean of the Faculty of Engineering and Vocational

Prof. Dr. Kadek Rihendra Dantes, S.T., M.T
NIP. 197912012006041001

DECLARATION

I hereby declare that the written work titled **"Comparison of Pixel-Based and Object-Based Land Use Land Cover Classification Using Satellite Imagery"** and its entirety are genuinely my original work, created without engaging in plagiarism or improper citation practices that violate the ethical standards of the scientific community. By making this declaration, I accept full responsibility for any sanctions that may be imposed if any violations of scientific ethics or challenges to the authenticity of my work are later discovered.

Singaraja, January 15, 2025

The one that makes a statement

Kadek Losinanda Prawira
NIM 2115101046

MOTTO

"Dream, strive, achieve"

FOREWORD

The author expresses gratitude to God Almighty for His blessings, as it is by His grace that the author has been able to complete the undergraduate thesis titled "Comparison of Pixel-Based and Object-Based Land Use Land Cover Classification using Satellite Imagery". This undergraduate thesis is written to fulfill the requirements for obtaining a Bachelor's degree in Computer Science from Universitas Pendidikan Ganesha.

The completion of this undergraduate thesis would not have been possible without the generous support and assistance from various parties, both morally and materially. The author wishes to express profound appreciation to:

1. Prof. Dr. I Wayan Lasmawan, M.Pd., as the Rector of Universitas Pendidikan Ganesha, who has provided educational facilities for the author in the university environment.
2. Prof. Dr. Kadek Rihendra Dantes, S.T., M.T., as the Dean of the Faculty of Engineering and Vocational Studies, who has provided motivation and facilities for the author in the faculty environment.
3. Dr. Putu Hendra Suputra, S.Kom., M.Cs., as the Head of the Informatics Engineering Department, who has provided motivation and facilities for the author in the department environment.
4. I Nyoman Saputra Wahyu Wijaya, S.Kom., M.Cs., as the Coordinator of the Computer Science Study Program and also as the second examiner, who has provided motivation and facilities for the author in the study program environment, and also provided very valuable input that has contributed to improving the research conducted.
5. Kadek Yota Ernanda Aryanto, S.Kom., M.T., Ph.D., as the first advisor who has given a lot of motivation, enthusiasm, guidance, and direction with full patience to the author in completing this undergraduate thesis.
6. Dr. Luh Joni Erawati Dewi, S.T., M.Pd., as the second advisor who has given a lot of motivation, enthusiasm, guidance, and direction with full patience to the author in completing this undergraduate thesis.

7. Ir. Ketut Agus Seputra, S.ST., M.T. as the first examiner who has provided very valuable input and suggestions that have contributed to improving the research conducted.
8. All lecturers in the Informatics Engineering Department or Computer Science Study Program who have provided knowledge, experience, motivation, and enthusiasm during the author's studies at Universitas Pendidikan Ganesha.
9. Asst. Prof. Dr. Pariwate Varnakovida as Director of KGEO together with KGEO staff, who provided opportunities to expand the author's knowledge, skills, and experience in various new fields.
10. The author's parents, Ketut Losin and Ni Luh Padmini, and the author's sister, Putu Prisca Lusiani, who always pray for, and provide encouragement, support, and motivation to the author.
11. The MIS Team (Karisma, Mellisa, Harry), who shared valuable knowledge and experiences that contributed to the author's personal growth during college life.
12. All friends of the 2021 cohort of the Computer Science study program, who have provided various experiences and togetherness during the author's college life.
13. All parties who have assisted that the author cannot mention one by one.

The author acknowledges that this undergraduate thesis is not without flaws and may contain shortcomings and errors, which may be attributed to the author's limited abilities and experience. Therefore, constructive feedback and suggestions from various parties are highly appreciated. It is hoped that this undergraduate thesis will be beneficial to those who require it.

Singaraja, January 15, 2025

Author

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES