

PREFACE

In the name of Allah, the Most Gracious, the Most Merciful.

All praise and gratitude are devoted to Allah SWT, whose endless mercy and guidance have enabled me to complete this Final Project, titled “Spatiotemporal Analysis of LULC Transitions and NO₂ Patterns in Bali Using Satellite Data and Machine Learning Techniques.” This work is submitted in partial fulfillment of the requirements for a Bachelor's degree in Information Systems, Faculty of Industrial Engineering, Telkom University.

- My deepest gratitude goes to Mr. Nur Ichsan Utama, S.T., M.T., Ph.D., my academic advisor, for his invaluable mentorship and unwavering support throughout this research. His thoughtful guidance, patience, and belief in my potential helped me stay focused and confident, even during the most challenging phases of this journey. I truly appreciate the time and attention he dedicated to helping me grow both academically and personally.
- I also sincerely thank Ms. Dita Pramesti, S.Si., M.Si., whose insightful advice and steady encouragement played a key role from the early stages of this project. Her honest feedback and warm support gave me the clarity and motivation I needed to stay on track and shape the direction of this research meaningfully. I am deeply grateful for her presence along the way.
- To my friends in SI-45-INT and IOSBC, thank you for being part of this academic journey. Your presence made both the toughest days and the best ones memorable.
- To my Final Project group, Putu Agus Aditya Dharma and Zhafran Virmanda Ilham, thank you for your dedication, energy, and teamwork. Sharing this process with you both turned a difficult task into an experience I'll always be proud of.
- Lastly, I extend sincere thanks to everyone who supported this project whether through knowledge, encouragement, or silent presence. You helped make this work possible.
- This project represents more than an academic requirement it marks a deeply transformative journey filled with challenges, relief, growth, and the

strengthening of my critical thinking and integrity. Behind every line of code and every analysis lies a story of perseverance, learning, and support from those around me.

- I recognize this project is far from perfect and welcome any constructive feedback. I hope it can contribute meaningfully to the growing field of environmental data analysis and machine learning.

With heartfelt gratitude,

Kevin Ariel Wibowo

Bandung, 15 July 2025