## ACKNOWLEDGEMENTS

This thesis is compiled with the effort, help, and support from all supporting elements. The author would like to express the deepest gratitude and thanks to:

- 1. Allah SWT, for all the love, guidance, and forgiveness in every mistake that the author has ever done, and Rasulullah SAW, as the role model who inspires the author in living life and striving to become a better person.
- 2. The author's beloved parents, the late Emi Sukaemi (Allahuyarham) and Jupri Supriadi, for their unconditional love, prayers, and sacrifices throughout the author's life. May Allah SWT grant the late mother the highest place in His paradise and bless the father with continuous health and guidance.
- 3. The author's beloved wife, Dewi Indri Triani, and children, Ismail Grahadi and Dzulqarnain Grahadi, for their endless prayers, love, patience, and unwavering support throughout the completion of this thesis.
- 4. The author's beloved younger brothers, Moch. Riyadul Fahmi and Abdul Goffar Fauzan, for their continuous support, encouragement, and heartfelt prayers throughout the completion of this thesis.
- 5. The supervisors, Prof. Dr. Indrarini Dyah Irawati, S.T., M.T., and Dr. Gelar Budiman, S.T., M.T., for their valuable guidance, constructive suggestions, and continuous encouragement that greatly helped improve this thesis.
- 6. All lecturers and staff of the Program of Master of Electrical-Telecommunication Engineering, School of Electrical Engineering, Telkom University, for the knowledge, assistance, and services provided during the author's study.
- 7. Fellow students, friends, and everyone who has provided help, encouragement, and input that supported the completion of this work.

The author realizes that this thesis is far from perfect. Therefore, constructive criticism and suggestions are highly welcomed for further improvement.

Bandung, 16<sup>th</sup> July, 2025

EGI NUGRAHA