

## ACKNOWLEDGMENTS

This thesis is compiled with the effort, help, and support from both students and lecturers. The author would like to express the deepest gratitude and thanks to:

1. My beloved parents, for endless love, prayers, and supports Mr. Suwardi and Mrs. Parjiah.
2. My beloved sister and brother, Mrs. Riski Anggun Kurnia and Mr. Ryan Andrian for supporting system the makes the author enjoy in finishing this thesis.
3. Mr. Muhammad Zakiyullah Romdlony, Ph.D as the first supervisor and Mr. Erwin Susanto, Ph.D as the second supervisor for the cooperation, contribution, help, and guidance in this thesis. Thanks for all the excellent advice and valuable input.
4. Mr. Muhammad Ridho Rosa, M.Sc as the my lecturer, for the contribution, guidance, and assisted the author in this thesis. Thanks for all the excellent advice and valuable input.
5. The entire faculty and employees of the Departement of Electrical Engineering, Postgraduate Telkom University, on the knowledge, guidance and assistance for the author to finish composing this thesis.
6. My friends, Rashad, Jakaisa, Haryasena, Bayu, Residents of the Masjid Syamsul 'Ulum, and Residents of the N307 for the support in completing this thesis.
7. All of my closest friends, for the presence, time, help, positive vibes, and supports that always accompany the author's steps in completing this thesis.
8. All lecturers in Telkom University that the author cannot mention all the names. Thnaks for your time, knowledge, advice and motivation that you have given to the writer since study in this great campus.

May all goodness be rewarded with kindness and always be given protection by Allah Subhanahu Wa Ta'ala. Amen Ya Allah Ya Rabbal Alamin.