中國文化大學工學院機械工程學系數位機電碩士班

碩士論文

Master's Thesis
Graduate Institute of Digital Mechatronic Technology
College of Engineering
Chinese Culture University

磁浮定位系統之適應性類神經控制設計

Adaptive neural control of a magnetic levitation system

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中華民國 104 年 6 月
June 2015

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經考試合格特此證明

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口 試 日 期 ： 中 華 民 國　104　年　06　月　23　日

ACKNOWLEDGEMENT

Foremost, I would like to express my deepest gratitude to my advisor Prof. Jeng-Tze Huang. I would never have been able to finish my dissertation without the guidance of my professor for the continuous support of my Master study and research. His guidance provided me some experiences in the research which helped me in all the time of doing research and writing of this thesis.

My sincere thanks also go to Graduate Institute Digital Mechatronic Technology- Chinese Culture University. Based on the theoretical foundations of Graduate Institute Digital Mechatronic Technology, my thesis built more reliable. Besides my advisor, I would also like to thank to the assistant of the Graduate Institute of Digital Mechatronic Technology- Chinese Culture University- Mrs. Shiu Wei-Jen. She always provided me with the useful information in the procedures of the university and on diverse exciting projects of my department.

In addition, a thank you to my classmates and laboratory mates for their assistances and encouragements. With their help, it is easy for a foreign student like me to do anything better than expected.

Last but not least, I would like to thank my family for their love, supports and sacrifices. Words cannot express how grateful I am to my family for all of the sacrifices that you've made on my behalf. Their encouragements are motivation for me to finish this thesis.

Pham Thanh Phong

June, 15th 2015

ABSTRACT

This thesis considers the position-tracking problem of a magnetic levitation system in the presence of modeling errors due to uncertainties of physical parameters. First, a dynamic model of the magnetic levitation system is derived. Then, a smooth switching adaptive robust control is proposed. The controller consists of three part, an adaptive linearizing controller using RBFN, robust controller, and an smooth function to switch between the above two controllers . The proposed controller improves the tracking performance and avoids the so-called control singularity occurred in a standard adaptive linearizing controller. Both simulation and experiments are carried out to verify the proposed method.

Keywords: Magnetic levitation system (Maglev), sliding mode control, smooth switching, neural network.

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