
Thesis Review

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Advanced Program on Automatic Control – Course 54th

Supervisor: Prof. Dr. Phan Xuan Minh

Reviewer: M.Sc. Dinh Thi Lan Anh

Topic: **Global tracking control of Under actuated ship using dynamic surface control method**

Comments:

1. Content

The thesis is divided into 3 chapters. The first chapter gives an introduction of the ship model, a model with fully 6 DOF, a simplified model with 3 DOF and problem of under actuated plant. The second chapter discusses about Dynamic Surface Control (DSC) method which is the integration of Back-Stepping method and Multiple Sliding Surface Control. The third chapter focuses on the application of DSC method to control the under actuated ship and simulation results.

This is a relative new and complicated topic requires a lot of theoretical study on the control method as well as the typical plant – under actuated ship. However, the references are not properly cited in many figures, formulas, tables and descriptions.

It can be seen that two students put a lot effort to fulfill the given tasks, but it still lack self-assessment of the work result and achievement in compare with the original work done in [1].

2. Thesis representation

In general, the thesis representation meets the demand, but not consistent (some formulas are numbered, some not, some in a strange order (page 40)); same case for figures – some with and without notes. There are many spelling mistakes (e.g. the name of DSC method from 1st page).

3. Questions

- Is there other method to control the under actuated ship? If yes, compare with DSC?

- There are assumptions are given to simplify the ship model: ship dynamic and kinematic do not depend on the outer condition such as wave, wind, current drifted forces; and the inner condition is fixed (p34), then this math model matches to which kind of ship?
- What are your achievements that similar or different in compare with [1]?

Rating points: for Le Dinh Trung
 for Nguyen Thanh Hai

Reference:

[1] Dongkyoung Chwa, “*Global Tracking Control of Underactuated Ships with Input and Velocity Constraints Using Dynamic Surface Control Method*”, IEEE Transactions on Control systems technology, Vol.19, No. 6, November 2011

Hanoi, June 18th, 2014

Reviewer

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