

EXAMINER'S REPORT

Candidate: Kai Li Lim

Title: Connected Autonomous Electromobility – Visual Navigation and Charging Analytic Frameworks

Degree: Doctor of Philosophy

Recommendation:

The thesis be classified as PASSED with no requirement for correction or amendments and the student be awarded the degree of Doctor of Philosophy

I believe this to be in the top 5% of thesis I have examined

This thesis reported an investigation in two topics which are currently being actively pursued in the academic and industrial communities - vision based navigation of autonomous vehicles and management of charging stations for electric vehicles (EVs). The topics have immense implications on the utilization of EVs with lower cost navigational system, and optimization or management of charging stations thereby contributing to the knowledge in the discipline, as well as reducing emission to the environment.

The thesis includes 11 chapters and the amount of content is substantially more than most of the other theses I have examined previously. In addition, 9 papers have been published in learned journals/transactions or international conferences, confirming the recognition or acceptance of this work by the scholastic community.

With respect to the criteria for the award of the degree as stated by the University of Western Australia, my comments are as follows:

- 1) The thesis as a whole is a substantial and original contribution to knowledge of the subject with which it deals. - **1 (Exceptional)**

The thesis is commendable with substantial amount of work in the literature review, a proposed framework, software and hardware development, plus practical data collection through experimental efforts. The contributions are recognized as each chapter between 2 to 10 have been published as either conference or journal papers. The experiments have been carried out in Western Australia which are unique and original.

- 2) The student show familiarity with, and understanding of, the relevant literature. **1 (Exceptional)**

The list of 431 references is impressive as the number is at least double of I have seen in most other PhD theses. In addition, I noted that the formatting of the references are all properly maintained. Chapter 2 and 3 reviewed the topics of visual road recognition and visual odometry and they have been very well written and comprehensively covered the topics.

- 3) The thesis provides a sufficiently comprehensive study of the topic. **1 (Exceptional)**

As mentioned above, the thesis effectively looked into two topics - visual navigation of autonomous vehicles and management of charging stations for EVs, they have been comprehensively studied with research, proposal, development and experiments. The candidates and supervisor(s) are to be congratulated on the success of their efforts.

- 4) The techniques adopted are appropriate to the subject matter and are properly applied.

1 (Exceptional)

The development and experimental approach is suitable for the project. As an engineering project, the research has gone through the stages of conceptual development, followed by implementation of the ideas and collection of practical data. The process is a proven means to verify and validate the proposed solutions addressing the research question.

- 5) The results are suitably set out, and accompanied by adequate exposition. **1**

(Exceptional)

The eleven chapters have been suitable laid out with adequate background and exposition. They followed a logical sequence and comprehensively covered the background as well as the work done with sufficient explanation and justifications.

- 6) The quality of English and general presentation are of a standard for publication. **1**

(Exceptional)

The quality of the presentation in terms of English and lay-out has been excellent. As most chapters have already been published, it is without doubt that the thesis is currently in a form acceptable to the research community.

Further comments and minor corrections are as follows:

Authorship Declaration:

2. “Paper presented as Chapter 3” – no description or citation of the paper that where and when it was published

Page 7, 2nd para, 3rd line: “...**Charing** station deployments are...” Should be “**Charging**”?

Page 9, 3rd para, 8th line, “have **studied produced** reports...” Did they study the published reports, or did they “studied **and** produced reports..”? Please clarify...

Page 17, Section 2.2, 2nd line, “2.2.1 to 2.2.5 **in chronologically**.” Should it be “in **chronological order**.”?

Page 72, last para, 2nd line, “Works that **combines** LiDAR...” should it be “**combine**”?

Page 236, 1st para, 1st line, “... was performed in Ireland, **finishing** in 2016... The study first **investigates**...” since the study was done in 2016, it should be in past tense. Should it be “**finished**” and “**investigated**”?



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