

30 May 2022

Ms Xie Yuxi
(A0228328B)
NUS

Dear Ms Xie

PHD QUALIFYING EXAMINATION - RESEARCH-BASED QE (CP5010)

I refer to the PhD Qualifying Examination that you have taken in March 2022, and I am pleased to inform you that you have successfully passed your research-based QE.

You will receive the additional S\$500 top up from 1 August 2022 (for 2 years, but not exceeding your fourth year candidature) or RS termination date, whichever is earlier.

The examiners have provided some comments for you to improve on your research work. Please consult your supervisor on the necessary areas of improvement for your PhD research.

Yours sincerely,



Chin Wei Ngan
Associate Professor and Vice-Dean
Graduate Studies

cc A/P Kan Min Yen, advisor, Dept. of Computer Science
 - examiners' comments are attached for your reference.

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EXAMINERS' COMMENTS

PHD QUALIFYING EXAMINATION – XIE YUXI

Reviewer 1:

[Student should demonstrate (i) a good understanding of the problem area and (ii) a general understanding of the existing or related methods for solving the problems in the research area.]

The student has demonstrated a good understanding of the problem area (Visual-Linguistic Commonsense Reasoning) and a general understanding of the existing or related methods for solving the problems in the research area.

[Student should be able to think critically (e.g., judge the pros and cons of an idea based on clear reasoning), analytically (e.g., deal with complexity by breaking down to smaller parts and think step-by-step), in a well-organized manner (e.g., interconnect different thoughts in a logical manner).]

The written report and oral presentation have shown the student's ability to think critically and analytically in a well-organized manner.

[Student should be able to effectively communicate his or her work (Evaluators to evaluate oral communication while advisor will evaluate written communication).]

The student was able to effectively communicate about the proposed research topic and preliminary results.

[Student should possess basic problem solving aptitude as expected from a Ph.D. candidate.]

From the written report and oral presentation, the student should possess basic problem solving aptitude as expected from a Ph.D. candidate.

Overall Recommendation:

I would recommend that the student should continue on as a PhD student.

Reviewer 2:

[Student should demonstrate (i) a good understanding of the problem area and (ii) a general understanding of the existing or related methods for solving the problems in the research area.]

The literature review and background is clearly explained. The analysis looks logical and convincing.

[Student should be able to think critically (e.g., judge the pros and cons of an idea based on clear reasoning), analytically (e.g., deal with complexity by breaking down to smaller parts and think step-by-step), in a well-organized manner (e.g., interconnect different thoughts in a logical manner).]

The student has demonstrated critical thinking skills. The problem is sufficiently articulated and trade-off discussed.

[Student should be able to effectively communicate his or her work (Evaluators to evaluate oral communication while advisor will evaluate written communication).]

It was a good presentation.

[Student should possess basic problem solving aptitude as expected from a Ph.D. candidate.]

The problem presented is interesting, but the results need to be validated by academic peers.

Overall Recommendation:

Overall, it is a good presentation on a promising topic. The student has demonstrated good research abilities.

Advisor:

[Student should demonstrate (i) a good understanding of the problem area and (ii) a general understanding of the existing or related methods for solving the problems in the research area.]

The related work descriptions are organised into individual descriptions, but need to be refined to better serve as a coherent critique or support of the organization of the related work. Currently, the descriptions rely on technical terminology rather than the necessary abstraction away from details and describing the motivation and thought processes needed to support the central thesis of the paper; i.e., needing both modalities to support common sense inference. How does knowing the detailed architectures for visual or linguistic aspects help support the claim or intention

Yuxi's citations are also not as in-depth as needed. Most of the citations are to very recent work, and as such, neglect the long historical legacy of V+L work that has come before, especially pioneering architectural work that laid much of the foundations for the incremental improvements that were cited.

[Student should be able to think critically (e.g., judge the pros and cons of an idea based on clear reasoning), analytically (e.g., deal with complexity by breaking down to smaller parts and think step-by-step), in a well-organized manner (e.g., interconnect different thoughts in a logical manner).]

The thinking aspect comes across in her literature review where Yuxi breaks down the related work along two pertinent dimensions of visual-linguistic integration and commonsense reasoning, and finally the integration of both components. The high level organization is clear, but mid-level organization of each section is muddled, using largely chronological organization which is the weakest to support any argumentation. It would be better if the candidate put more thought and imposed an argumentative ordering that favours her own agenda in the proposed research.

[Student should be able to effectively communicate his or her work (Evaluators to evaluate oral communication while advisor will evaluate written communication).]

Yuxi generally writes well for her first draft for the stage of student she is at. She able to define the general problem to be tackled but requires more editing and refinement arrive at shorter, direct language needed for precise writing. Chapter 1 tries to lay out the problem but because the scope of the chapter is too broad and the problems are not well-defined, the description is imprecise and lacks key organisational clarity as to the problem and the scope of the work.

The preliminary work in Chapter 3 states that it is motivated by the weaknesses that brought up in Chapter 2, but unfortunately Chapter 2 does not clearly articulate these weaknesses (their scope and central premise) in the component three areas identified. In the literature review, Yuxi identifies these areas but does not clearly codify the weaknesses of each; and in Chapter 3, does not clearly address how her planned innovations will take on the work.

A key method to improve the writing is to treat the work as a survey, where key motivating (data) examples are picked to show weaknesses of the current task formulations and to motivate the proposed versions, where both linguistic and visual features are both mandatory to support the necessary inference. Yuxi does identify such issues in the current QE paper, but they are not signalled appropriately and her word choice and sentence structure needs to improve in order for her points to come across clearly. Yuxi also can also describe the previous works at the appropriate level of detail so that key features of prior art can be described without needing to rely on domain-specific terminology.

In general, her writing can be improved but I think is of sufficient quality to pass for this round. She needs to spend more time editing and fixing her argumentation and linking her argumentation more

clearly at the middle and lower levels, and connecting them across chapters - i.e. why are certain architectural decisions made and how their decisions address the weaknesses identified. Her word choice and phrasing can also be improved but these are minor concerns

Other comments:

- Why begin with greedy nature?
- How are common sense reasoning resources static and limited? Show us how.
- Looking for a solid problem statement. Needs a crisp definition
- It's not clear what exactly is reasoning anyways?
- Needs more high-level outlining before going into the detailed level.
- Is all common sense knowledge equated as social interactions?
- Needs a bit more proofreading and more careful word choice.

[Student should possess basic problem solving aptitude as expected from a Ph.D. candidate.]

Yuxi has proposed a set of filters that are assisted by human annotation to address the identified bottlenecks in her domain. I feel these are clear wins to improve the dataset and to remove source data that do not fit the desired profile for the data annotation task. She has co-opted an existing dataset (after investigating potential data sources and their biases) to capitalise on existing work and models that use that data source, demonstrating resourcefulness.

Improvement can come from defending and justifying decisions more clearly in her writing and more precise cross-referencing of weaknesses and benefits from the discussion of prior work.

Overall Recommendation:

Yuxi has done an admirable job of a difficult area in her work of examining vision and language commonsense reasoning. There is a lot of work to absorb and to sense make, and she has identified primary axes for pertinent investigation, given the large amount of competition by related teams.

She can definitely improve on her primary writing skills (inclusive of careful proofreading, and appropriate hierarchical argumentation and justification of design choices). We hope to continue her work in an appropriately scoped survey on vision/language commonsense reasoning.