# THESIS REVIEWER'S REPORT

## I. IDENTIFICATION DATA

| | |
|---|---|
| **Thesis title:** | **Temporal Consistency for Object Pose Estimation from Images** |
| **Author's name:** | **Vojtěch Přibáň** |
| **Type of thesis :** | bachelor |
| **Faculty/Institute:** | Faculty of Electrical Engineering (FEE) |
| **Department:** | Department of Cybernetics |
| **Thesis reviewer:** | Radoslav Škoviera |
| **Reviewer's department:** | Department of Robotics and Machine Perception, CIIRC |

## II. EVALUATION OF INDIVIDUAL CRITERIA

| **Assignment** | **challenging** |
|---|---|
| The assignment was relatively challenging. The student needed to understand and utilize non-trivial mathematical concepts, such as factor graphs. | |

| **Fulfilment of assignment** | **fulfilled** |
|---|---|
| The assignment goals were fulfilled completely. | |

| **Methodology** | **correct** |
|---|---|
| The methodology of the work was correct. Existing approaches were explored and based on them, a novel method for temporal object pose consistency was proposed. The method was then evaluated on several datasets, including standard benchmark datasets. <br> I would appreciate if the proposed method was also evaluated against simpler filtering techniques, such as standard Bayesian filtering methods. However, for the scale of bachelor's thesis, the current evaluation is sufficient. | |

| **Technical level** | **A - excellent.** |
|---|---|
| Technical level of the thesis is excellent. The proposed method and evaluation approach are both very well described. | |

| **Formal and language level, scope of thesis** | **A - excellent.** |
|---|---|
| The thesis is well structured and easy to follow. The student first discusses related approaches, then describes the proposed method. Afterwards, the implementation and evaluation with results is described. I appreciate the section with limitations of the proposed method and short discussion of how they might be solved in the future wok. <br> The work contains only minor typographical errors. | |

| **Selection of sources, citation correctness** | **A - excellent.** |
|---|---|
| All sources are correctly cited. The student's contributions are clearly explained and separated from previous work. | |

| **Additional commentary and evaluation (optional)** |
|---|
| I have no special remarks, other than the proposed approach is quite good, considering it is only bachelor's thesis. |

**III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE**

The thesis considers a currently important topic of stabilizing pose estimations from neural network-based pose estimators. The proposed method, as evaluated against baseline estimator, shows promising improvements in pose estimation accuracy. The work is well written. The method is experimentally evaluated on several datasets, including standard benchmarks. Although, as mentioned previously, it would be even better if it was compared to some simple filtering method. Overall, I evaluated the work as excellent.

I would like to ask the student a few questions:

1) You mentioned that you achieve near real-time performance. However, I missed some deeper evaluation & discussion about HW requirements and runtimes of the method. Can you, please, provide at least some basic information about the computational requirements?
2) You mentioned that the motion model supports addition of acceleration (higher pose derivatives). There is no evaluation of constant-pose model on the dynamic dataset. Did you do some preliminary tests and the constant-pose model performed poorly? Do you think that adding acceleration to the model will provide significantly increased accuracy (considering presumably higher computation cost) for "normal" object motion (e.g., when objects are moved by a human)?
3) Is the performance (precision & recall) of the proposed method affected by mis-labeling of objects from the pose estimator?

The grade that I award for the thesis is **A - excellent.**

Date: **10.6.2024**                                   Signature: