

Dear reviewers,

We are writing to submit a revised version of our manuscript titled “Neuro-Symbolic Reasoning in the Traffic Domain” as a position/vision paper for your reconsideration for the inaugural issue as a RESUBMIT of #676-1656. Firstly, we would like to thank the reviewers for the insightful feedback, and the opportunity to revise our paper and address their suggestions.

In response to the reviewers' inquiries regarding the terminology and formalization of Knowledge Graphs (KGs) and rules in NeSy Systems, we have clarified our position on these terms. We have added a few sentences about this at the end of point 2 in section 6, to clarify that we remain neutral to the best formalism. In Section 4.2, we added information about other types of symbolic reasoning beyond rules; including (1) formal logic + (2) frame based representations. We also added references to relevant literature discussing the various types of rules and their implications for NeSy Systems, such as the work by Oxford Semantic Technologies [1] in Section 2.2.

Furthermore, we have adjusted the scope of our paper to focus on post hoc prediction within the traffic domain, as suggested by the reviewers. We also revised Figure 1 to reflect this change and to make the tasks consistent in granularity. While we briefly mention other aspects such as racing, traffic infrastructure, and simulation, we emphasize our primary focus on post hoc prediction tasks. This clarification is reflected in both the introduction and discussion sections of the revised manuscript. We have also added real-world examples (notably in Sections 2, 4 and 5), to emphasize the need and significance of NeSy in the traffic domain.

We have revised sections 2, 3, and 4 to make their overview of prior work more systematic. To help with this goal, we have added a new figure 2 that shows schematically two architectural patterns common in neuro-symbolic methods for robust reasoning, which organize the methods in 4.1.

Furthermore, we have added Section 5: a discussion on the drawbacks and limitations of NeSy reasoning, as suggested by the reviewers. This section provides a balanced assessment of our proposed methodology versus other AI approaches. We addressed the point of implementation and validation of our approach and how it could be applied to real-world traffic scenarios. This is also highlighted in the abstract, introduction and conclusion, and in Section 6's point 3.

In conclusion, we believe that these revisions substantially improve the quality and clarity of our manuscript and address the major concerns of the reviewers. If there are any other desired changes, please let us know.

[1] <https://www.oxfordsemantic.tech/blog/reasonable-vehicles-rule-the-road>