

Erratum for “Reverse Engineering Queries in Ontology-Enriched Systems: The Case of Expressive Horn Description Logic Ontologies”

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This erratum discusses a mistake regarding the query-by-example problem for ontology languages \mathcal{ELI} and Horn- \mathcal{ALCI} in [2]. In the text between Lemma 4 and Lemma 5 it is claimed that \mathcal{P} can be decomposed into a non-tree-shaped part and a tree-shaped part. However, the described decomposition is not possible in the case when inverse roles are present and thus Lemma 5 fails for that case. Since Lemma 5 underlies two upper bound proofs, this lead to two false statements in the paper:

1. Query-by-example in Horn- \mathcal{ALCI} is *not* in 2-EXPTIME if the separating query is required to be a conjunctive query (claimed in Corollary 7 and Theorem 9).
2. The size of a separating conjunctive query is *not* bounded by a four-fold exponential in the case of Horn- \mathcal{ALCI} (claimed in Theorem 14).

The other parts of the statements in Corollary 7, Theorem 9 (regarding the UCQ case), and of Theorem 14 remain correct. Also, all results in the paper regarding Horn- \mathcal{ALC} and \mathcal{EL} remain untouched by the mistake. A simplified presentation of these results can be found in [3].

In fact, it was shown in a follow-up paper that the problem in Point 1 is undecidable already for the sublogic \mathcal{ELI} of Horn- \mathcal{ALCI} and thus the size of a separating conjunctive query cannot be bounded [1].

References

- [1] Maurice Funk, Jean Christoph Jung, Carsten Lutz, Hadrien Pulcini, and Frank Wolter. Learning description logic concepts: When can positive and negative examples be separated? In *Proceedings of IJCAI 2019*, pages 1682–1688, 2019.
- [2] Víctor Gutiérrez-Basulto, Jean Christoph Jung, and Leif Sabellek. Reverse engineering queries in ontology-enriched systems: The case of expressive

horn description logic ontologies. In *Proceedings of the 27th International Joint Conference on Artificial Intelligence (IJCAI-ECAI-18)*. AAAI Press, 2018.

- [3] Leif Sabellek. *Ontology-Mediated Querying with Horn Description Logics*. PhD thesis, University of Bremen, 2019.