A Correction Note on "Propositional Dynamic Logic With Quantification Over Regular Languages"

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April 1, 2022

Unfortunately, after [1] went to print, the author discovered an error in the announced *EXPTIME*-completeness proof based on an embedding into deterministic **PDL**. The error lies in the definition of the translation function t (Def. 6 of [1]); it turns out that t maps specific formulas that are not equivalent in **QPDL** into the same formula of **DPDL**. Therefore, Lemma 8 cannot hold. Consequently, the decidability status of **QPDL** and its natural fragments studied in [1] remains open.

We also note that Example 1 in [1] contains a confusing error. It is stated there that in a model where S is the grid $\omega \times \omega$, $R_a((n,m)) = \{(n+1,m)\}$ and $R_b((n,m)) = \{(n,m+1)\}$, $\langle (a \cup b)^*] p$ is satisfied in $(0,0)$ iff there is k such that p is satisfied in all (n,m) such that $n+m=k$. This is incorrect. The correct version of the example uses only $R_a((n,m)) = \{(n+1,m),(n,m+1)\}$ and the formula $\langle a^*] p$. A simplified version of this example can be formulated as follows:

Example 1. As an example of a model, consider the full binary tree where, for some fixed $a \in A$, $R_a(s)$ is the set of children of node s. Then $\langle a^*] p$ is satisfied at the root of the tree iff there is a level U in the tree (i.e. a set of nodes such that there is $n \in \omega$ such that $t \in U$ iff the distance of t from the root is n) such that p is satisfied in all elements of U. Dually, $[a^* \rangle p$ is satisfied in the root of the tree iff p is satisfied in some node in each level of the tree.

References

[1] I. Sedlár. Propositional dynamic logic with quantification over regular computation sequences. In S. Artemov and A. Nerode, editors, *Logical Foundations of Computer Science*, pages 301–315, Cham, 2022. Springer International Publishing.