Comments and Corrections

Corrections to “On the Decidability and Complexity of Diagnosability for Labeled Petri Nets”

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This note aims to correct a complexity result in our paper [1] that investigates the verification of diagnosability for unbounded Petri nets. The main result of [1] is Theorem IV.1, which shows that the diagnosability verification problem can be reduced to a Petri net model checking problem called Yen’s problem [2]. This main reduction is still correct. However, it was pointed out by Atig and Habermehl [3] that Yen’s original complexity result is not completely correct. Specifically, they showed that (i) in general, Yen’s problem is still decidable, but it is as hard as the reachability problem, which corrects the original EXPSPACE-completeness claim in [2]; and (ii) for a special case called the increasing fragment, Yen’s problem can be solved in EXPSPACE.

In [1], we adopted the original complexity result in Yen’s 1992 paper [2], which is not correct. Since our formula in Theorem IV.1 does not belong to the increasing fragment, the following changes are needed.

1) In Theorem IV.2, the sentence “Moreover, it is in EXPSPACE” needs to be removed. We can only claim that verifying diagnosability is decidable. The corresponding claims in the abstraction, introduction, and conclusion also need to be revised accordingly.

2) In Theorem V.1, “EXPSPACE-complete” needs to be corrected as “EXPSPACE-hard.”

Finally, we would like to emphasize that all other constructions and proofs in [1] are still correct. Our paper [1] is still the first one that establishes the decidability of diagnosability for general unbounded Petri nets without any assumption on the unobservable net, which is the main contribution of [1]. Also, our proof for the EXPSPACE-hard lower bound in the paper still holds. However, the precise complexity class of this problem is still open.

REFERENCES