

Errata for the POPL'23 paper
“*Stratified Commutativity in Verification Algorithms for
Concurrent Programs*”

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Errata

- Section 6 of the paper presents an algorithm that checks whether a given proof covers every interleaving of a concurrent program, modulo *stratified commutativity*. It is claimed (Theorem 6.12) that the algorithm precisely decides the premise of the so-called *decidable n -stratified proof rule* – inclusion (4) in the paper.

In fact, only one implication direction holds (*soundness*): if the algorithm claims the inclusion holds, then it does indeed hold. The algorithm is however not complete.

Section 4.4 of my thesis [3] presents a corrected picture, and also clarifies that the algorithm nevertheless generalizes the proof rules based on a single commutativity relation (Theorem 4.36). The question of whether the premise of the so-called *decidable n -stratified proof rule* is indeed (precisely) decidable has since been answered in the negative [1].

References

- [1] FARZAN, A. Undecidability of stratification of commutativity relations. Tech. rep., University of Toronto, 2026. Available at <https://www.cs.toronto.edu/~azadeh/resources/papers/pop123-errata.pdf>.
- [2] FARZAN, A., KLUMPP, D., AND PODELSKI, A. Stratified commutativity in verification algorithms for concurrent programs. *Proc. ACM Program. Lang.* 7, POPL (2023), 1426–1453.
- [3] KLUMPP, D. *From Commutativity to Proofs and Back Again: Reduction and Verification of Concurrent Programs*. Phd thesis, University of Freiburg, Freiburg, Germany, Feb. 2026.