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Efficient Detection and Validation of Atomicity Violations in
Concurrent Programs

Mahdi Eslamimehr, Mohsen Lesani, George Edwards

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Highlights

- A three-access pattern instance detection technique that can direct execution during dynamic analysis towards three-access pattern candidates, thereby finding more bugs than other techniques;
- Specification and proof of sufficient conditions for non-atomicity of the three-access pattern, which allows efficient pruning of all false positives from the output;
- An implementation of the atomicity violation detection and verification techniques in a tool for Java programs;
- An evaluation of the tool through comparison with five existing tools that indicates that our techniques are superior to existing state-of-the-art techniques.

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