



Software Engineering Seminar

Fuzzing for Bug Detection

Description

Fuzzing can be used to effectively find bugs (vulnerabilities, crashes,...) in software systems. One major problem is, e.g., the execution of branches that are protected by so-called "magic byte comparisons" (e.g., string equality comparison). Usually, fuzzing techniques struggle to efficiently find the correct input values to execute these branches. Recently, a program-state based fuzzing technique has been proposed in [2] that supposedly deals with this problem at the minor cost of execution speed, for example.

The student is to examine and to discuss fuzzing techniques with regards to bug detection and to evaluate and compare their capabilities.

References

- [1] Caroline Lemieux and Koushik Sen. Fairfuzz: Targeting rare branches to rapidly increase greybox fuzz testing coverage. *CoRR*, abs/1709.07101, 2017.
- [2] Yuekang Li, Bihuan Chen, Mahinthan Chandramohan, Shang-Wei Lin, Yang Liu, and Alwen Tiu. Steelix: program-state based binary fuzzing. In *Proceedings of the 2017 11th Joint Meeting on Foundations of Software Engineering, ESEC/FSE 2017, Paderborn, Germany, September 4-8, 2017*, pages 627–637, 2017.

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