Software Engineering Seminar

# Automated Crash Reproduction

## Description

Software failures are typically reported to developers who then try to reproduce the failure to find the root cause and subsequently to verify whether their changes actually fix the problem. Manually reproducing a bug can be a costly and complex tasks so that techniques have been proposed that support creating high-quality bug reports [1] or automated the crash reproduction [3, 4, 5], for instance, given a stack trace and a faulty software a test case is created that reproduces the reported crash (stack trace) in the software.

The student should explore and discuss the current state of the art in automated crash reproduction by investigating, discussing, and comparing such automated techniques.

## References


[1] Oscar Chaparro, Carlos Bernal-Cárdenas, Jing Lu, Kevin Moran, Andrian Marcus, Massimiliano Di Penta, Denys Poshyvanyk, and Vincent Ng. Assessing the quality of the steps to reproduce in bug reports. In *Proceedings of the 2019 27th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, ESEC/FSE 2019, pages 86–96, New York, NY, USA, 2019. ACM.

[2] Kevin Moran, Mario Linares-Vásquez, Carlos Bernal-Cárdenas, Christopher Vendome, and Denys Poshyvanyk. Automatically discovering, reporting and reproducing android application crashes. In *2016 IEEE International Conference on Software Testing, Verification and Validation (ICST)*, pages 33–44, April 2016.

[3] Mozhan Soltani, Pouria Derakhshanfar, Annibale Panichella, Xavier Devroey, Andy Zaidman, and Arie van Deursen. Single-objective versus multi-objectivized optimization for evolutionary crash reproduction. In Thelma Elita Colanzi and Phil McMinn, editors, *Search-Based Software Engineering*, pages 325–340, Cham, 2018. Springer International Publishing.

[4] Mozhan Soltani, Annibale Panichella, and Arie Van Deursen. Search-based crash reproduction and its impact on debugging. *IEEE Transactions on Software Engineering*, 2018. (early access).

[5] Yu Zhao, Tingting Yu, Ting Su, Yang Liu, Wei Zheng, Jingzhi Zhang, and William G.J. Halfond. Recdroid: Automatically reproducing android application crashes from bug reports. In *2019 IEEE/ACM 41st International Conference on Software Engineering (ICSE)*, pages 128–139, 2019.


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