



Software Engineering Seminar

# Effective Search-Based Automated Program Repair

## Description

The research field of automated program repair is currently explored using different strategies to tackle the inherent difficulties. *Search-based automated program repair* approaches generally struggle to generate good patches (or any patches at all), due to *extremely large search spaces*. For example, a recently proposed technique [2] proposes to use *context information* to better guide the search for patches. Another approach aims to generate more correct patches by automatically deriving contracts that the generated patches have to fulfill [1].

The student is to examine and discuss approaches that aim to make (search-based) automated repair techniques more effective in terms of both quality and quantity.

## References

- [1] Liushan Chen, Yu Pei, and Carlo A. Furia. Contract-based program repair without the contracts. In *Proceedings of the 32Nd IEEE/ACM International Conference on Automated Software Engineering, ASE 2017*, pages 637–647, Piscataway, NJ, USA, 2017. IEEE Press.
- [2] Ming Wen, Junjie Chen, Rongxin Wu, Dan Hao, and Shing-Chi Cheung. Context-aware patch generation for better automated program repair. In *Proceedings of the 40th International Conference on Software Engineering, ICSE '18*, pages 1–11, New York, NY, USA, 2018. ACM.

## Contacts

Simon Heiden ([heiden@informatik.hu-berlin.de](mailto:heiden@informatik.hu-berlin.de))  
Software Engineering Group  
Institut für Informatik  
Humboldt-Universität zu Berlin