Software Engineering Seminar (WiSe 2020/21)

Effort-Aware Just-In-Time Defect Identification

Description

Just-in-time (JIT) defect identification, a.k.a. change-level defect identification, is referred to as identifying defect-introducing code or commit change of a software at check-in time [4]. One well-known approach for JIT defect identification is the SZZ algorithm, first introduced by Sliwerski, Zimmermann, and Zeller [4], aiming to identify defect-inducing changes in software based on bug reports by traversing the change history associated with a target defect. As developers are suggested to inspect the defective changes after the identification process to give fresh feedbacks, many recent JIT defect identification approaches have been considering the inspection effort of defect-inducing changes as a key factor, which are referred to as *effort-aware JIT defect identification* [2]. In general, these approaches fall into two directions–supervised [1] and unsupervised [2, 3]. In addition, studies [2, 5] have been conducted to assess their performance with respect to measures such as F1-score.

In this seminar, the student is required to examine and discuss the state-of-the-art effort-aware JIT defect identification approaches, and to compare their, e.g., technical details and performance.

References

[1] Qiao Huang, Xin Xia, and David Lo. Revisiting supervised and unsupervised models for effort-aware just-in-time defect prediction. *Empirical Software Engineering*, 24(5):2823–2862, 2019.

[2] Yasutaka Kamei, Emad Shihab, Bram Adams, Ahmed E Hassan, Audris Mockus, Anand Sinha, and Naoyasu Ubayashi. A large-scale empirical study of just-in-time quality assurance. *IEEE Transactions on Software Engineering*, 39(6):757–773, 2012.

[3] Jinping Liu, Yuming Zhou, Yibiao Yang, Hongmin Lu, and Baowen Xu. Code churn: A neglected metric in effort-aware just-in-time defect prediction. In *2017 ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM)*, pages 11–19. IEEE, 2017.

[4] Jacek Śliwerski, Thomas Zimmermann, and Andreas Zeller. When do changes induce fixes? *ACM sigsoft software engineering notes*, 30(4):1–5, 2005.

[5] Meng Yan, Xin Xia, Yuanrui Fan, David Lo, Ahmed E Hassan, and Xindong Zhang. Effort-aware just-in-time defect identification in practice: A case study at alibaba. Preprint on webpage at `https://xin-xia.github.io/publication/fse201.pdf`.

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