

Automated Testing to Detect Instance Data Loss in Android Applications

Authors : Anusha Konduru, Zhiyong Shan, Preethi Santhanam, Vinod Namboodiri, Rajiv Bagai

Abstract : Mobile applications are increasing in a significant amount, each to address the requirements of many users. However, the quick developments and enhancements are resulting in many underlying defects. Android apps create and handle a large variety of 'instance' data that has to persist across runs, such as the current navigation route, workout results, antivirus settings, or game state. Due to the nature of Android, an app can be paused, sent into the background, or killed at any time. If the instance data is not saved and restored between runs, in addition to data loss, partially-saved or corrupted data can crash the app upon resume or restart. However, it is difficult for the programmer to manually test this issue for all the activities. This results in the issue of data loss that the data entered by the user are not saved when there is any interruption. This issue can degrade user experience because the user needs to reenter the information each time there is an interruption. Automated testing to detect such data loss is important to improve the user experience. This research proposes a tool, DroidDL, a data loss detector for Android, which detects the instance data loss from a given android application. We have tested 395 applications and found 12 applications with the issue of data loss. This approach is proved highly accurate and reliable to find the apps with this defect, which can be used by android developers to avoid such errors.

Keywords : Android, automated testing, activity, data loss

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