HW7: Paper from 2015

1. *Reference*:

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Versatile yet Lightweight Record-And-Replay for Android

*OOPSLA 2015*

*Keywords*:

* 1. **Record-And-Replay:** Recording and replaying the execution of smartphone apps is useful in a variety of contexts, from reproducing bugs to profiling and testing.
  2. **VALERA:** A tool that supports Record-And-Replay on the Android platform. VALERA works with apps running directly on the phone, and does not require access to the app source code.
  3. **Android No Response (ANR):** Android No Response (ANR) error: Android will raise an ANR and kill the app if the UI thread cannot handle an event within 5 seconds or if an IPC event gets no response for 10 seconds.

*ii) Paper Contents:*

* 1. **Motivational Statements**: Proposing stream-oriented record-and-replay approach which achieves high-accuracy and low-overhead by aiming at a sweet spot: recording and replaying sensor and network input, event schedules, and inter-app communication via intents.
  2. **Related Work**: i) The author’s previous work RERAN is used to record and reply GUI gestures. RERAN does not require app instrumentation or AF changes.

(ii) Library-based approaches record the nondeterminism interaction between the program libraries and underlying operating system with a fixed interface.

(iii) R2 extends them by allowing developers to choose which kinds of interfaces they want to replay by a simple annotation specification language.

* 1. **Hypotheses**: (i) VALERA is an approach and tool for versatile, low-overhead, record-and-replay of Android apps.

(ii) VALERA is based on the key observation that sensor inputs, network activity and event schedules play a fundamental role in the construction and execution of smartphone apps, hence

recording and replaying these two categories is sufficient for achieving high-accuracy replay.

* 1. **Future work**: stream-oriented replay could be applied in other contexts besides smartphones, e.g., replay of time-sensitive or stream-processing programs on desktop/server platforms.

iii) *Needs Improvement:*

* 1. The environment used for conducting the evaluation is pretty outdated having specifications which have improved significantly over time. The results thus obtained may not hold true for present time.
  2. The authors have assumed a uniform sampling distribution for the operational profile. However, in practice, such a scenario is rare and the sample may be skewed as per the usage patterns of the software under consideration.