

HW7: Paper from 2015

i) *Reference:*

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Versatile yet Lightweight Record-And-Replay for Android

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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.
- 3) **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.
- 4) **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- 1) The environment used for conducting the evaluation is pretty outdated having specifications which have improved significantly over time.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.