Dear Editor and Reviewers,

This paper is an extension of the conference paper “Android Multitasking Mechanism: Formal Semantics and Static Analysis of Apps “ (APLAS 2019).

This paper extends the conference paper in the following four aspects.

1. The formal semantics of the Android multitasking mechanism in the APLAS paper was defined for activities and Android 6.0-8.0. This paper defines the semantics for both activities and fragments and Android 6.0-13.0.
2. The formal semantics in the APLAS paper was validated by using only a specially designed Android app. This paper validates the formal semantics by auditing the source code of Android OS, doing experiments on the open source Android apps, in addition to a specially designed Android app.
3. Dynamic model extraction is added in this paper, in addition to the static model extraction in the APLAS paper.
4. The benchmarks for the static analysis have been extended compared to those in the APLAS paper.

We also confirm that you have expanded your paper to adhere to the ACM policy of adding at least 40% new material.

Finally, since this is a resubmission, the comparison with the APLAS paper has been checked by the reviewers of the previous submissions.