Summary

The hype in the popularity of recent wireless technologies has increased applications of smartphones in various fields, particularly, education and health care. The trend of increasing application functionality to enrich smartphone users experience requires detailed insights of application energy consumption behavior. Smartphone application energy estimation helps investigate energy consumption behavior of applications at diversified granularity when it is run on resource-constrained devices. Fine granular estimation gives more insights to the application energy consumption behavior to assist developers to propose resource-friendly application designs. This study proposes a lightweight code analysis–based estimation framework to minimize high profiling overhead of use-based estimation methods. Moreover, it analyzes estimation overhead and accuracy of existing dynamic estimation tools to present a case for code analysis–based energy estimation method. The estimated energy is found 86% accurate to the ground truth value for a set of benchmarks using our proposed framework.
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