

Catalog of Energy Patterns for Mobile Applications

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PRESENTATION ABSTRACT

Software engineers make use of design patterns for reasons that range from performance to code comprehensibility. Several design patterns capturing the body of knowledge of best practices have been proposed in the past, namely creational, structural and behavioural patterns. However, with the advent of mobile devices, it becomes a necessity a catalog of design patterns for energy efficiency. In this work, we inspect commits, issues and pull requests of 1027 Android and 756 iOS apps to identify common practices when improving energy efficiency. In particular, we answer the following research questions:

RQ1: *Which design patterns do mobile app developers adopt to improve energy efficiency?*

RQ2: *How different are mobile app practices addressing energy efficiency across different platforms?*

This analysis yielded a catalog with 22 design patterns related to improving the energy efficiency of mobile apps. The catalog can be accessed online through the following link:

<https://tqrg.github.io/energy-patterns/>

We argue that this catalog might be of relevance to other domains such as Cyber-Physical Systems and Internet of Things. As a side contribution, an analysis of the differences between Android and iOS devices shows that the Android community is more energy-aware. Efforts to improve energy efficiency are more common within Android apps (25%) than iOS apps (10%).

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