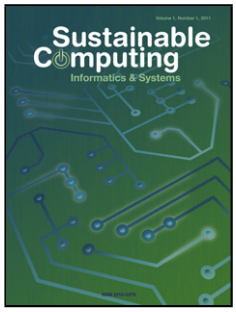

Title: Energy saving strategies in the design of mobile device applications

Author: Amilcar Meneses Viveros Erika Hernández Rubio Sonia Mendoza José Rodríguez Ana Belem Márquez Quintos

PII: S2210-5379(17)30398-0
DOI: https://doi.org/doi:10.1016/j.suscom.2018.07.011
Reference: SUSCOM 267

To appear in:

Received date: 17-10-2017
Revised date: 12-7-2018
Accepted date: 24-7-2018

Please cite this article as: Amilcar Meneses Viveros, Erika Hernández Rubio, Sonia Mendoza, José Rodríguez, Ana Belem Márquez Quintos, Energy saving strategies in the design of mobile device applications, *<![CDATA[Sustainable Computing: Informatics and Systems]]>* (2018), https://doi.org/10.1016/j.suscom.2018.07.011

Energy saving strategies in the design of mobile device applications

Amilcar Meneses Viveros[a], Erika Hernández Rubio[b], Sonia Mendoza[a], José Rodríguez[a], Ana Belem Márquez Quintos[a]

[a]*Departamento de Computación, CINVESTAV-IPN, Av. IPN 2508, Col. San Pedro Zacatenco, Ciudad de México, 07360*
[b]*Instituto Politécnico Nacional, SEPI-ESCOM, Ciudad de México, 07738*

Abstract

As is well known, the main restriction in mobiles devices is battery duration, so strategies for energy saving in mobile devices should be designed and implemented. In this paper, key considerations in the design of mobile applications are studied from the energy consumption point of view. It has been found that rendering and processing tasks requiring high computational complexity entail increased consumption of energy. Consequently, different techniques, developed at the hardware and operating system levels, have been proposed to improve energy efficiency in mobile devices. On one hand, at the application level, there also exist some approaches, such as Mobile Computation Offloading (MCO) and Graphical User Interface (GUI)design. However, these approaches only consider connectivity and usability problems, putting battery management aspects aside. On the other hand, there are several surveys on saving energy in mobile devices, but many focus on some specific strategies, such as the use of wireless networks or MCO. The main contribution of this work is a literature review, analyzing various strategies for energy saving, emphasizing in those that deal with the development of applications. Unlike other similar articles, we have included several strategies from the literature and those developed and tested by our research group. As shown by our results, the studied strategies prevent energy consumption considerations from affecting other aspects of the application design, such as GUI adaptability and information management.

Email address: ameneses@cs.cinvestav.mx (Amilcar Meneses Viveros)

Preprint submitted to Sustainable Computing, Informatics and Systems *July 12, 2018*