PURDUE INNOVATES | Office of Technology Commercialization

Fine-Grained Power Modeling for Smartphones Using System Call Tracing

This new power model accurately tracks energy consumption by monitoring system calls, enabling precise identification of energy usage down to individual application threads for better optimization.

Mobile devices are more prevalent and powerful; however, performance is outpacing battery technology. Smartphones require more energy to run, which significantly reduces battery life and limits mobility. The first step in improving battery life is to model the energy consumption of the device and the applications. Power modeling for smartphones is currently based on hardware utilization models that are only accurate at estimating the amount of energy applications use in general; such modeling does not identify the amount of energy used by specific parts of the app.

Researchers at Purdue University have developed a new power model for smartphones that can achieve accurate, fine-grained energy estimations better than current models. By tracking system calls instead of utilization, this new model can better estimate the utilization of hardware and can relate it back to specific subroutines or threads. This improved level of accuracy in power tracking allows further optimization to manage battery use and performance.

Advantages:

-More accurate power estimation

-Energy use can be traced back to originating thread

TRL: 8

Intellectual Property:

Provisional-Patent, 2012-04-09, United States

Utility Patent, 2013-04-09, United States

Technology ID

66174

Category

Automotive & Mobility

Tech/Battery Management & Charging Technologies

Authors

Paramvir Bahl

Yu Charlie Hu

Abhinav Pathak

Yi-Ming Wang

Ming Zhang

Further information

Matt Halladay

MRHalladay@prf.org

Erinn Frank

EEFrank@prf.org

View online

Keywords: tech solutions, cloud infrastructure, cloud computing, IT security, technology consulting, marketing technology, Customer Relationship Management (CRM), Search Engine Optimization (SEO), Marketing Automation, Analytics, Computer Technology, Computing Methods, Electrical Engineering, Energy Storage, Telecommunications