System And Method For Energy-Efficient, Modularized Quantification And Outcome Prediction In Mobile Devices

Tech ID: 26012 / UC Case 2016-152-0

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OTHER INFORMATION

KEYWORDS

mobile platforms

CATEGORIZED AS

- **Communications**
  - Wireless

RELATED CASES

2016-152-0

BACKGROUND

In today's world, mobile devices are becoming more sophisticated and capable of performing more complex functions especially with the availability of medical apps which are designed to assist individuals in their own health and wellness management. Most of the mobile devices contain both a sensor and a processor. However, the devices are increasingly being tasked with gathering or acquiring data and transmitting that data to an external or cloud server. The process of digitizing and wirelessly transmitting the data to an external server, requires a large consumption of energy; most mobile devices are constrained by the battery energy that is readily available.

TECHNOLOGY DESCRIPTION

UC San Diego researchers have overcome this constraint by designing a more energy efficient data interpretation method that contains an internal sensor(s) that can communicate directly with an internal processor. The processor runs a Bayesian inference algorithm on data collected by the sensor and characterizes the uncertainty quantification around the latent variables of interest. This sets in motion an optimization algorithm to calculate the posterior of the data from the sensor. The processor can then transmit in an intelligent manner, only a representation of the data to an external server, thereby saving energy.

APPLICATIONS

The system is modularized and is universally applicable for different types of sensing, for example speech, video and physiologic monitoring. It is also suitable for wearables, mobile phones and tablets.

ADVANTAGES

The algorithm allows for bi-directional communication thereby allowing a remote device to communicate and re-configure the tolerance settings for what should be estimated and what the boundaries are in terms of estimate and uncertainty intervals. This also results in significant energy savings, thus preserving battery life. In addition, If the mobile device is equipped with an actuator (speaker, LED, or electric stimulator) the system will allow for closed-loop sensing, interpretation and actuation without the need for relaying information wirelessly to an external device.

STATE OF DEVELOPMENT

The invention has been implemented within a portable, multi-core processor (e.g. the Parallela system). This technology allows for parallelized computation by virtue of the Graphic Unit Processing (GPU) solution, which can be implemented in wearables, mobile phones, or tablets. A working computer model simulation of an analog solver comprised of N circuits suggests that this technology can be used in future analog hardware systems.

INTELLECTUAL PROPERTY INFO

Provisional patent application filed.

INQUIRIES TO: invent@ucsd.edu

RELATED MATERIALS

- M. Mendoza, S. Kim, and T. P. Coleman, "Bayesian LASSO in a Distributed Architecture", IEEE Global Conference on Signal and Image Processing, December 2015. - 12/01/2015

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	2017106743	06/22/2017	2016-152

Additional Patent Pending

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