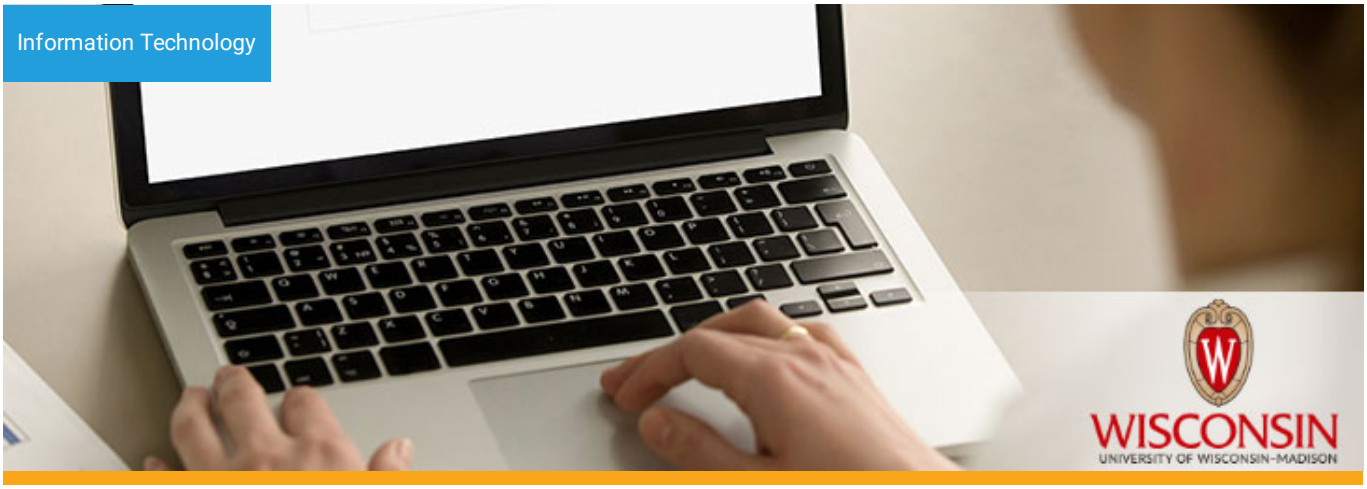
Information Technology



Ultra-Efficient Continuous Monitoring of Sensors

View U.S. Patent No. 9,541,982 in PDF format.

WARF: P130049US01

Inventors: Mikko Lipasti, Atif Hashmi, Andrew Nere, Giulio Tononi

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing reconfigurable, event-driven hardware that continuously monitors data streams and invokes a primary processor only when triggered.

Overview

Tracking emissions, sensing earthquakes and monitoring patient brain waves are just a few of the applications that rely on changing, real-world information. In typical systems, sensors pass on raw data streams that then are analyzed by a low-power general purpose processor or central processing unit (CPU). These processors look for preset trigger signatures that identify whether an event has occurred or not.

Analyzing raw data streams takes lots of energy. To save battery life, processors are designed for bursts of activity followed by sleep or idle modes. But this approach drains power when usage needs to be ongoing – such as checking electroencephalograph (EEG) activity. Special microcontrollers designed for continuous sensing still waste energy and compute resources. New tools need to maximize efficiency.

The Invention

UW–Madison researchers have developed reconfigurable event-driven hardware that enables low-power continuous monitoring by offloading tasks from the primary processor.

The hardware interfaces with sensors and invokes the processor only when a trigger signature is detected. It can be implemented as a separate integrated chip or as a low-power compute resource within the primary processor.

Applications

- Continuous sensing hardware/software package
- Healthcare, safety, environmental and military monitoring
- Usage in mobile consumer devices

Key Benefits

- 1,000-fold energy reduction
- Primary processor spends almost no power in sampling sensors.
- Hardware can monitor any number of sensors and any kind of spatial/temporal trigger signatures.
- Easy to train and reconfigure during runtime
- Prolongs battery life

Additional Information

For More Information About the Inventors

- Giulio Tononi

Related Technologies

- WARF reference number P06419US describes a method to promote deep sleep using EEG signal monitoring and slow brain wave stimulation.

Related Intellectual Property

- View Continuation Patent in PDF format.

Tech Fields

- Analytical Instrumentation, Methods & Materials : Sensors
- Information Technology : Hardware

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846