Abstract

Affective Systems have been used in different applications, such as stress monitoring in aircraft seats and managing sensitivity in autism spectrum disorder. Although many scientific progresses have been made there are many computational challenges to be overcome in order to embedded affectivity into traditional user interfaces. For example, context-sensitive algorithms, low-complexity pattern recognition models and hardware customizations are requirements to support the simplification of user's experience becoming more intuitive, transparent and less obstructive. In this paper an affective gamepad is presented. This acquisition system has been developed to improve user's biofeedback when they are playing games on Microsoft Xbox or Sony PlayStation. The preliminary version of Emopad is able to capture Galvanic Skin Response (GSR), Temperature, Force, Heart Rate (HR) and its variability (HRV) by photoplethysmography (PPG) sensor while complementary algorithms are executed to filter noise, recognize interests patterns and classify events related to user's emotional states. All processing phases are embedded into Emopad, and they explore microcontroller's dynamic power management. Emopad has been developed to deal with energy-efficient and platform-independent requirements. Concerning to this paper's aim,
the acquisition systems development is highlighted. Also, the sliding window-based algorithm is presented and evaluated. It has been applied after sampling in GSR, Force, Temperature and HR signals to detect events related to emotional responses. The success of affective gamepads can lead to a paradigm shift, because traditional consoles can be configured to work as Point-of-Care technologies. Consequently, they can receive, process and transmit physiological data and events related to clinical conditions about their users.

References

Emopad: An Affective Gamepad

2014.
- J. Bishop, "Thermistor temperature transducer-to-ADC application" in Analog Applications Journal, Texas Instruments Incorporated.
- Epcos, "NTC thermistors for temperature measurement"; Mar 2013.
- Game Jolt, "Death Unknown"; Online: http://gamejolt.com/games/other/death-unknown-v-1-2/16329/

**Index Terms**

Computer Science

Embedded Systems

**Keywords**

Affective Gamepad; Affective Systems;