**A Flexible Open Source Sensor Hub for AAC**

Yih Lerh Huang1 Bocar N'Diaye2  Bruce Braidek3

A common paradigm for AAC users with complex communication needs involves the use of switch controls. These dedicated AAC devices readily interface with modern smartphone, tablets and environment control units (ECU), enabling the AAC users to interact with common devices using the Human Interface Device (HID) protocol, typically over USB or Bluetooth. Switch control input devices could be micro-switches, infrared sensors, touch sensors or any other sensors, which capture a user’s intentional output. Typically, a sensor produces a binary output for the host unit such as a tablet, personal computer. These iOS, Android and Windows-based devices now have accessibility options, which make such interfacing straightforward. There is however limitation as to how the input signals are calibrated. The calibration may be fixed, or it may be restricted to what is available on the input device.

Recent advances in open source hardware make possible (1) more flexible calibration (2) the incorporation of innovative input sensors as well as (3) the use of output modalities beyond simple ‘clicks’ or specific key codes to encompass also direct mouse controls rather than just moving arrow keys (“directional”, which is an alternative input method for many).

We make available an open source design for a flexible sensing hub that can be quickly configured by an end user or an AAC professional. This hub, named Sensact, has built-in calibration capability based on setting an analog threshold. The output is configurable to iOS, Android, Windows and laptop keys. Sensact adopts a common physical interface, so that different input sensors can be easily tried in a plug-and-play fashion. For added flexibility, the hub has adopted the ‘shield’ concept, which makes it compatible with the Arduino platform so that, beyond what our own configuration software enables, the behaviour of the Sensact hub can also be extended by custom programming.

Notes:

[1] Principal Researcher, Ability Spectrum & Volunteer, Bruyère Continuing Care

[2] Assistive Technologist, Bruyère Continuing Care

[3] Volunteer, Bruyère Continuing Care

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Correspondence:

Yih Lerh Huang, YLH@GMX.COM