CogniPad™ powered by NeuroMem

Tablet with Perception and Intelligence for Human and Object Social Interactions

Goals

- Design a pad with Perception and Intelligence
 - Real time object, scene and event understanding
 - Front sensor fusion: person, faces, gaze, gesture, etc
 - Rear sensor fusion: scenery, wildlife, packaging, etc
- Establish NeuroMem chips as the only possible enabler for CogniPad
 - Continuous recognition without draining the battery of the system
 - Capable of real-time learning
 - Cope with simple but also ill defined and complex situations
- Offer an open access technology platform
 - Allows researchers and non-profits to have free access to the schematics, knowledge (neurons contents) and software (Android 4.1)
 - Make a reference design available to developers so they can develop applications reaching wide audiences
- Involve some large strategic marketing partners
 - Demonstrate to the cell phone/tablet top manufacturers
 - Gain exposure for the IntelliGlass technology patented jointly by <u>General Vision</u> and <u>Asahi Glass</u> (manufacturer of Dragontrail)

CogniPad front panel

Pair of low-resolution CogniSensor for image recognition, stereoscopy, distance evaluation Inputs via touch screen, voice commands, gesture, facial expression



CogniPad back panel

Pair of low-resolution CogniSensor for image recognition, stereoscopy, distance evaluation



Pair of microphones for voice recognition, noise cancellation, directive noise recognition

Possible functionalities

- ► Front and Back
 - User authentication
 - ► Face, Iris, Voice, EKG
 - Facial Expression
 - ▶ Gesture
 - Lips reading
 - Voice recognition
 - Noise recognition
 - More to be defined...

- Front perception
 - Eye detector
 - Power on/off, orientation detection
 - Gaze tracker for UI
 - Scroll, highlight the focused area, etc
- Back perception
 - Motion detection/tracking
 - Barcode reading/OCR
 - Object recognition
 - storefront, outdoor, zoos, museums
 - Scene understanding

Targeted Applications

- Serious Games
 - Alphabetization appliance in under-developed countries
 - Brain exercise appliance with direct feedback
- User-aware remote control (TV, appliances)
- Living-aid assistant for handicap and elderly people
- Shopping assistant (product and shopper recognition)
- Selective recorder (audio, video)
- Access control appliance
 - Touch less interface (gesture and gaze)
- More to be imagined...

Components

- Sensory inputs
 - Low Res sensors
 - High Res sensors
 - Lenses
 - Microphones
 - MEMs
 - ► GPS (optional)
- Cognitive computing
 - NeuroMem chips
- Output
 - Touch screen LED display
 - Stereo speakers

- ANDROID 4.1
- Communications
 - ► G4, Wi-Fi
 - UIRDA (ultra speed IRDA)
 - Blue Tooth
 - ▶ USB 3 OTG
 - Storage
 - Flash, DDR3
 - Removable SD card
 - Other
 - Image compression chip (optional)

Architecture

