



HearTouch: Android Hearing Aid for Tactile Communication

Mingduo Dun, Matthew Morea, Ron Ocampo

Sponsored and Mentored by Professor Luke Theogarajan

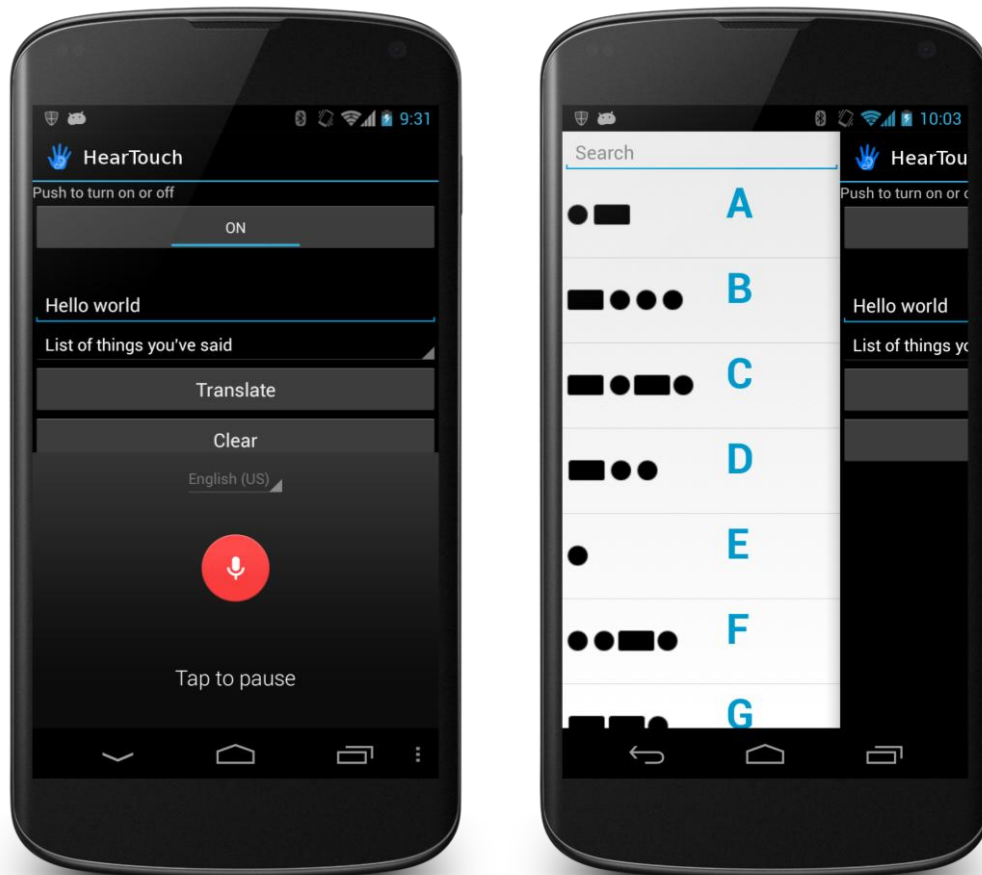
Department of Electrical and Computer Engineering

University of California at Santa Barbara

Hearing loss is a serious problem affecting millions of individuals worldwide. Existing solutions for hearing loss include hearing aids and cochlear implants. These, however, can be very costly and may require invasive surgery. HearTouch is radically different. While other devices attempt to repair or recover a lost sense, we seek to take advantage of an entirely separate sense – touch.

HearTouch is a portable electronic device that uses the sense of touch to help the deaf and hard of hearing communicate. Our product has a very small footprint and is meant to fit snugly in an armband pouch - the same ones used for holding MP3 players while exercising. This comfortable and unobtrusive design allows for high ease of use. A small, rechargeable lithium-ion battery provides the power. To deliver the translation to the end device, we have developed an Android application that converts incoming speech to Morse code and then sends this to a microcontroller, which vibrates the patterns on the user's arm.

Due to its flexibility, other applications can be designed for the HearTouch hardware that utilize touch in order to help those with other disabilities. For instance, we envision a GPS-based Android application that can provide turn-by-turn walking directions from vibrational motors. This could be integrated into white canes used for the blind. The versatility of this device can offer a range of products and open a whole new market for affordable solutions to sensory loss.



HearTouch Android application (left: main page; right: side menu)

Five main parts compose the hardware of HearTouch: the IOIO microcontroller, a boost converter, a polymer lithium ion battery, a vibrational motor, and an armband.