Electronic Braille Display for the Visually Impaired

Tran, Dieu Lien
Nguyen, Du

The authors aim to create an affordable electronic Braille display that can be widely assembled in most of the countries and well-equipped with essential functions. Feedbacks are collected from visually impaired people about the product's concept and prototypes. Alternative solutions to creating Braille display are researched by dividing them into 2 groups: special materials and mechanical mechanisms. Four versions are developed and experimented. For the first version, electro-magnets and armatures of relays are used to set the states of the Braille pins to demonstrate the use of levers and electro-magnets. The displayed Braille characters are proved to be readable by the visually impaired. For the second version, rotating mechanism is designed with only three pushers. Braille pins pass reset, set areas and the characters are shown continuously under users' finger in the display area. For the third version, flexible pieces are placed beneath the Braille pins. When a piece is pulled by a mechanism beneath, the pin sinks. The fourth version is an upgradation and a combination of the first version and the fourth version. Electro-magnets are used to control a series of actuators. A flexible membrane is used to reset the states to low. 12 standard-sized Braille characters are displayed. The arrangement of the components makes it possible to extend the display. Users can also type in Braille characters and use SD-cards. A program is created to convert texts (from files, images, or keyboard input) to signals that are sent to the Arduino to implement the display. The software is multi-functional and designed to be blind-compatible with memorable hot keys and sound notification. A font is created and added to the program as a simple tool to check the accuracy of the display.

Awards Won:
Fourth Award of $500