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Voice Feedback for Interactive Displays

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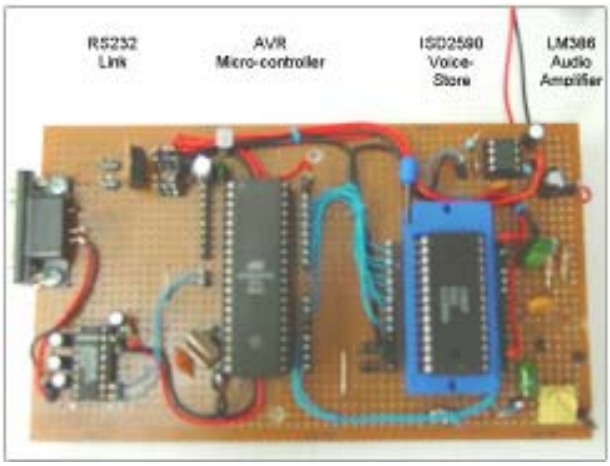

Overview

Generating voice cues or feedback to stimulate and inform potential customers is an exciting application of Information Technology, even though it can be expensive to implement. Now, with a micro-controller some proximity sensitive switches and inexpensive voice store technology, engaging interactive displays can be cheaply constructed.

Voice Store Technology

At Otago Polytechnic, a 90 second Voice Store chip created by WINBOND (the ISD2590) has been used to create interactive displays that provide recorded voice feedback. The ISD2590 chip provides a maximum analog bandwidth of 2.3Khz, but this can traded up to nearly 3.4Khz by using a 60 second device instead (the ISD2560).

The ISD2590 'memory' is externally addressable and this allows the programmer to store multiple sound bites in memory, and also access them randomly. Naturally, this lends itself to some form of local manipulation by a microprocessor. At Otago Polytechnic we have implemented this control with an Atmel AVR micro-controller and the customer interface with a touch-sensor IC produced by Quantum Research Group (QProx QT110)

Customer Interface

The QProx QT110 relies on Kirchoff's current law to detect the change in capacitance of an electrode (the sensor) when a body touches or comes near to it. The QT110 can be configured to react to near-proximity contact, and therefore the sensors can be hidden within a display and be activated by customers being enticed to touch a "hot spot".

System Control and Programming

With the utilisation of the AVR, an interface point has been created where customer events from the sensors can be decoded and appropriate signals sent to the ISD2590 to cause the replay of the required sound-bite. Configuration of the system can be achieved via a serial interface, and this allows the programmer to make rapid changes and couple customer events with specific sound-bites.

As well as facilitating the tactile customer interface, the AVR also supports the programming of the analog information into the ISD2590. A desktop application makes contact with the AVR via a serial link, and then establishes a list of .WAV files (the sound bites) whose contents are to be stored into the ISD2590. The application controls the AVR as it plays the .WAV files (analog) into the ISD2590, which ensures that the sound-bite is placed into the correct address-space of the ISD2590.

A structure of address and control information is finally sent to the AVR, which stores it in non-volatile EEPROM and forms the basis for a table that links customer tactile events with sound-bites in the ISD2590.

Summary

Voice feedback can be easily and cheaply implemented, and with the addition of 'smart' sensors almost any object can be turned into the source of an engaging customer interaction.

www.winbond.com

www.qprox.com

www.atmel.com