AUTOMATIC TOUR GUIDE SYSTEM

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Abstract— The purpose of this paper is to create a position aware multimedia learning system. Here we are using ATGS device and it is aware of the position of the visitor. As the visitor walks up to a specific exhibit, without any clicks or operations, the system can retrieve the corresponding information of that exhibit automatically. The first is a set of signal transmitters which are pre-installed at different locations of a museum or a scenic spot. The second is a handset device(ATGS device) carried by a visitor. The client device can determine the position of the visitor by detecting the signal emitted from the pre-installed transmitters at different locations. Accordingly, it will automatically deliver the corresponding contents to the visitor.

Keywords - RF Module, RF Transmitter, RF Receiver, ARM.

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1 INTRODUCTION

A museum provides physical surroundings for touring people to acquire knowledge. Countries all over the world are using museums as a core facility to promote culture, art and tourism by widening their collections and services. Exhibitions in museums generally have descriptions beside them in the form of written board or pamphlets. However, these media are inconvenient for visually impaired people, children and older people. Therefore, many museums employ guides to provide vivid descriptions. However, the limited human resources mean that they can only provide group guidance is provided, and are unable to guide each visitor individually. Recent advances in information and networking technology, along with the increase in ownership of wireless network devices, have led museums to begin to construct wireless guidance systems. Current wireless guidance systems in museum adopt wireless RFID technology to place RFID tags on their collections. A user may detect the specific identification number coded on the collection items through RFID Readers onto his PDA to access or save the guidance information via the wireless network. Additionally, since the effective reflection distance of the positioning of the tag is short, the sensitivity of the guidance machine to the tag decreases in large crowds. Wireless networking technology integrates wireless networking technology and established museum content in digital archives format, and easily applies geographic information systems to provide Location-Aware Tour Guide System.

2 RELATED WORKS

Four types of museum tour guide service media are currently available, namely; Expositors, Tape Machines, CD Players, and PDAs. According to the table, the PDA has the major benefit of a low variable cost, making it the least expensive format from a long-term point of view, first of all. The content of the collections can easily be integrated to provide inquiry services. Furthermore, in terms of interface design, a multimedia format is provided by combining sound, image and text together, and even multi-language services. Therefore, this study uses PDA as the tour guide service media for museum.

3 GOAL

The inconvenience of the present mechanisms gives the motivation to develop an Automatic Tour Guide System, based on the modern wireless technologies and hand-held devices, for mobile learning in museums to overcome the drawbacks of the traditional mechanisms. Seeing every museum as virtual classrooms, the developed system aims to make every visitors not just seeing the exhibit, but also knowing or learning about the exhibit without extra efforts.

4 TECHNICAL SPECIFICATIONS

4.1 Keil IDE's

This tool is used to develop the source code needed for the design. The tool helps us not only to develop but also compile the code and simulate the code. The keil tool is also used to convert the compiled Embedded C code to its equivalent hex code. **Keil** was founded in 1982 by Günter and Reinhard Keil, initially as a German GbR. In April 1985 the company was converted to *Keil Elektronik GmbH* to market add-on products for the development tools. Keil implemented the first C compiler designed from the ground-up specifically for the 8051 microcontroller.

4.2 Embedded C

Embedded C is a set of language extensions for the C programming language by the C standards committee to address commonality issues that exist between C extensions for different embedded systems. Historically, embedded C programming requires nonstandard extensions to the C language in order to support exotic features such as fixed-

point arithmetic, multiple distinct memory banks, and basic I/O operations. In 2008, the C Standards Committee extended the C language to address these issues by providing a common standard for all implementations to adhere to. It includes a number of features not available in normal C, such as, fixed-point arithmetic, named address spaces, and basic I/O hardware addressing. Embedded C use most of the syntax and semantics of standard C, e.g., main() function, variable definition, datatype declaration, conditional statements (if, switch. case), loops (while, for), functions, arrays and strings, structures and union, bit operations, macros, unions, etc.

4.3 RF Module (Radio Frequency)

Radio Frequency, any frequency within the electromagnetic spectrum associated with radio wave propagation. When an RF current is supplied to an antenna, an electromagnetic field is created that then is able to propagate through space. Many wireless technologies are based on RF field propagation.

Figure 1 Receiver Module

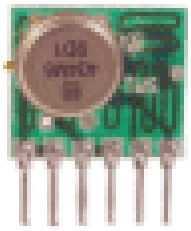

Figure 2 Transmitter Module

Radio frequency 10 kHz to 300 GHz frequency range that can be used for wireless communication. Radio Frequency. also used generally to refer to the radio signal generated by the system transmitter, or to energy present from other sources that may be picked up by a wireless receiver.

- Wireless mouse, keyboard
- Wireless data communication
- Alarm and security systems
- Home Automation, Remote control
- Automotive Telemetry
- Intelligent sports equipment

4.4 RF Transmitter

The TWS-434 extremely small, and are excellent for applications requiring short-range RF remote controls. The transmitter module is only 1/3 the size of a standard postage stamp, and can easily be placed inside a small plastic enclosure. TWS-434: The transmitter output is up to 8mW at 433.92MHz with a range of approximately 400 foot (open area) outdoors. Indoors, the range is approximately 200 foot, and will go through most walls. The TWS-434 transmitter accepts both linear and digital inputs, can operate from 1.5 to 12 Volts-DC, and makes building a miniature hand-held RF transmitter very easy. The TWS-434 is approximately 1/3 the size of a standard postage stamp.

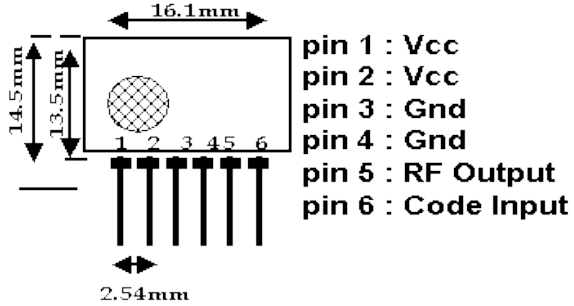

Figure 3 TWS-434 Pin Diagram

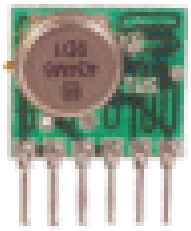

Figure 4 Transmitter Module

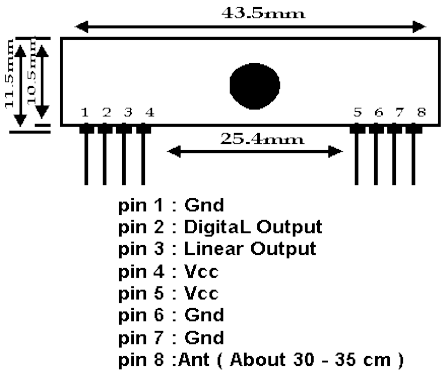

Figure 6 RF Receiver

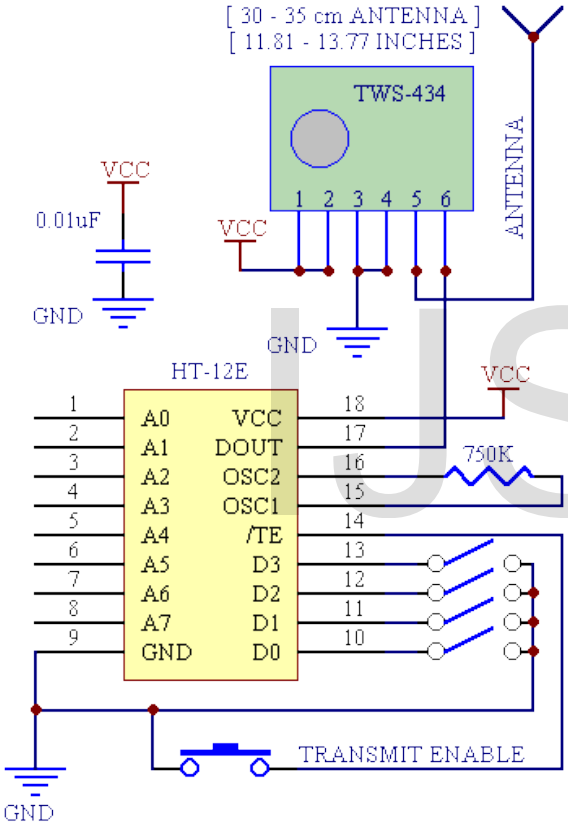

Figure 5 Transmitter Application Circuit

4.5 RF Receiver

It also operates at 433.92MHz, and has a sensitivity of 3uV. It operates from 4.5 to 5.5 volts-DC, It has both linear and digital outputs.

4.6 ANTENNAS- WIRE WHIP

The WC418 is made of 26 gauge carbon steel music wire that can be soldered to a PC board. This antenna has a plastic coated tip for safety and is 6.8 inches long, allowing .1 inch for insertion in a terminal or PC board.

Figure 7 Antenna

The following should help in achieving optimum antenna performance:

• Proximity to objects such a users hand or body, or metal objects will cause an antenna to detune. For this reason the antenna shaft and tip should be positioned as far away from such objects as possible.

•Optimum performance will be obtained from a 1/4 or 1/2 wave straight whip mounted at a right angle to the ground plane. A 1/4 wave antenna for 418 Mhz is 6.7 inches long.

•In many antenna designs, particularly 1/4 wave whips, the ground plane acts as a counterpoise, forming in essence, a 1/2 wave dipole. Adequate ground plane area will give maximum performance. As a general rule the ground plane to be used as counterpoise should have a surface area => the overall length of the 1/4 wave radiating element (2.6 X 2.6 inches for a 6.7 inch long antenna).

•Remove the antenna as far as possible from potential interference sources. Place adequate ground plane under all potential sources of noise.

4.7 ARM

Architecture of ARM is Enhanced RISC Architecture. It has large uniform Register file. Employs Load Store Architecture- Here operations operate on registers and not in memory locations. Architecture is of uniform and fixed length. 32 bit processor. It also has 16 bit variant i.e. it can be used as 32 bit and as 16 bit processor.

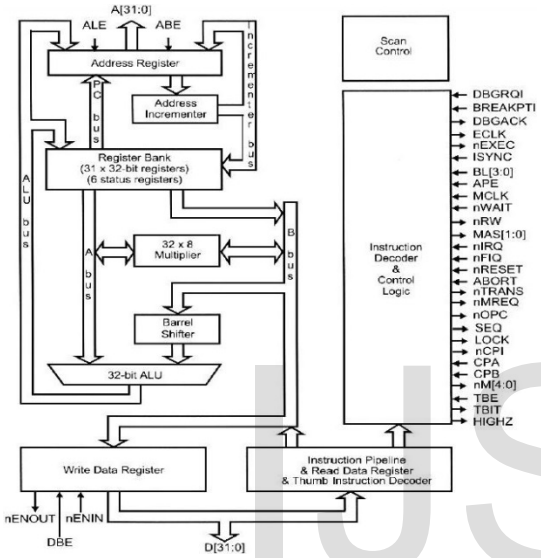

Figure 8 ARM Architecture

4.8 4x20 characters LCD Display

This is a LCD Display Module with 4x20 characters and yellow/green LED backlight. LCD display uses STN technology so it has a great contrast and a wide viewing angle. Display module is controlled by SPLC780D parallel interface chipset that is easy to use.

Figure 9 4x20 LCD

Features

- Number of Characters: 20 characters x 4 Lines
- Character Table: English-European (RS in Datasheet)
- Viewing area: 77.0 x 26.5 mm, Active area: 70.4 x 20.8 mm
- Dot size: 0.55 x 0.55 mm
- Dot pitch: 0.60 x 0.60 mm, Character size: 2.95 x 4.75 mm
- Character pitch: 3.55 x 5.35 mm
- LCD type: Yellow-green STN Positive, Transflective
- Backlight Type: Yellow/Green LED
- Viewing direction: 6 O'clock
- Supply Voltage For Logic: 5V
- Supply Voltage of backlight: 3,8 - 4,2 V (180mA)
- Operating Temperature -20 to +70 °C

5 CONCLUSION

In this paper, we proposed a multi-device, location-aware guide supporting museum or visits. Its main contribution is in the ability to exploit multi-device environments, in which users can freely move about with their mobile guide. The access to museum or visit information can benefit from the availability of multiple devices which are detected through RFID tags.

ACKNOWLEDGMENT

We would like to thank our guide Prof**. Ranjana .M. Kedar**, for her guidance and support. We will forever remain grateful for the constant support and guidance extended by guide, for the completion of paper.
Also we thank International Journal of Scientific & Engineering Research (IJSER).

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