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Smart Museum based on Wi-Fi Technology

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Abstract: A Smart city is one the current topic in both the academic literature and industrial world. The capability to provide the users with added services through low-power and low-cost smart object is attractive in many fields. One among these is art and culture which is a part of tourism. Since tourism is one of the main aspects of the modern society, in this paper we propose a smart museum based on indoor localization service using Wi-Fi signal strength (RSSI) and to display the corresponding multimedia data based on the position of the visitor through the Bluetooth connectivity using a mobile phone.
Keywords: Smart cities, Indoor localization service, Wi-Fi, RSSI, Multimedia data, Bluetooth.

I. INTRODUCTION

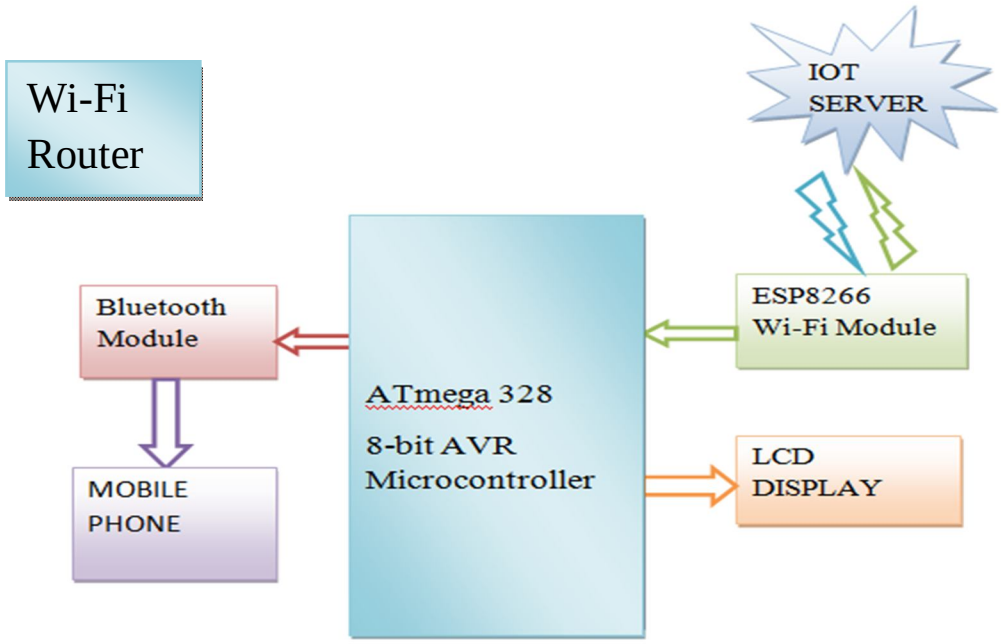
The development of technology aims at realizing smart environment so that it is able to capture all useful information from the real world and to automatically anticipate user's needs. The continuous attention towards this new vision puts an extraordinary stress on the so-called smart cities. Among all possible areas of applicability of ICT technologies, art and culture are becoming more and more interesting since they play an important role in the society.

Over the centuries, hundreds of museums have preserved our diverse cultural heritage and served as important sources of education and learning. An interactive and personalized museums need to be developed, in this perspective a significant contribution is dedicated by information and communication technology, which aims to create a smart museum for people, where a smart wearable device act accordingly to provide the necessary information in accordance with the requirements.

II. PROPOSED DESIGN METHODLOGY

The proposed system block diagram is shown in the figure 1, represents the wearable device which is major component of the smart museum. It is based on indoor localization architecture using Wi-Fi signal strength (RSSI) so as to determine the position of the visitor and to display the corresponding information based on the position of the visitor through the Bluetooth using a mobile phone.

A. Block Diagram



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III. HARDWARE IMPLEMENTATION

A. Arduino Uno

Arduino Uno is a microcontroller that processes the data. It has 14 digital input\output pins, 6 analog pins and 16MHz quartz crystal for its internal operations.

B. Bluetooth Module

Bluetooth is a wireless technology for exchanging data over short distance between two devices. Invented by telecom vendor Ericsson in 1994, it was originally conceived as a wireless alternative to RS-232 data cables.

C. ESP8266 Wi-Fi Module

The ESP8266 is a Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by Shanghai-based Chinese manufacturer, Espressif Systems.

D. IoT Server

The IoT servers can be used for various purposes like administration, monitoring, data gathering and analysis. IoT server function as a complete solution, enabling the manufacturer to manage devices, build applications, secure the data and visualize sensor data scalable.

E. LCD Display

LCD (Liquid Crystal Display) screen is a flat-panel display or electronically modulated display used in wide range of applications.

F. Power Supply

The system requires 12v, 1.5A power supply to operate in the required direction.

IV. RESULTS

The entire experimental set-up is shown in the figure and the results are obtained as follows exactly when the person is in front of the statue.



Figure 2: Initial experimental set-up of the proposed system.



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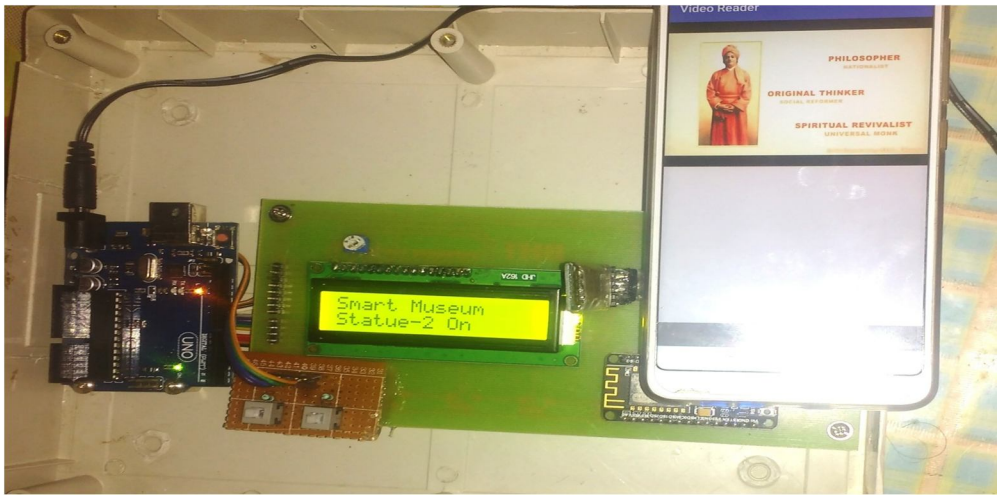


Figure 3: Results obtained when the person is in front of statue.

V. CONCLUSION

In this system, we have presented an indoor location aware architecture for smart museum. The system depends on a wearable device outfitted with location detection based on Wi-Fi module and confinement capacities to automatically furnish users with cultural contents identified with the observed arts.

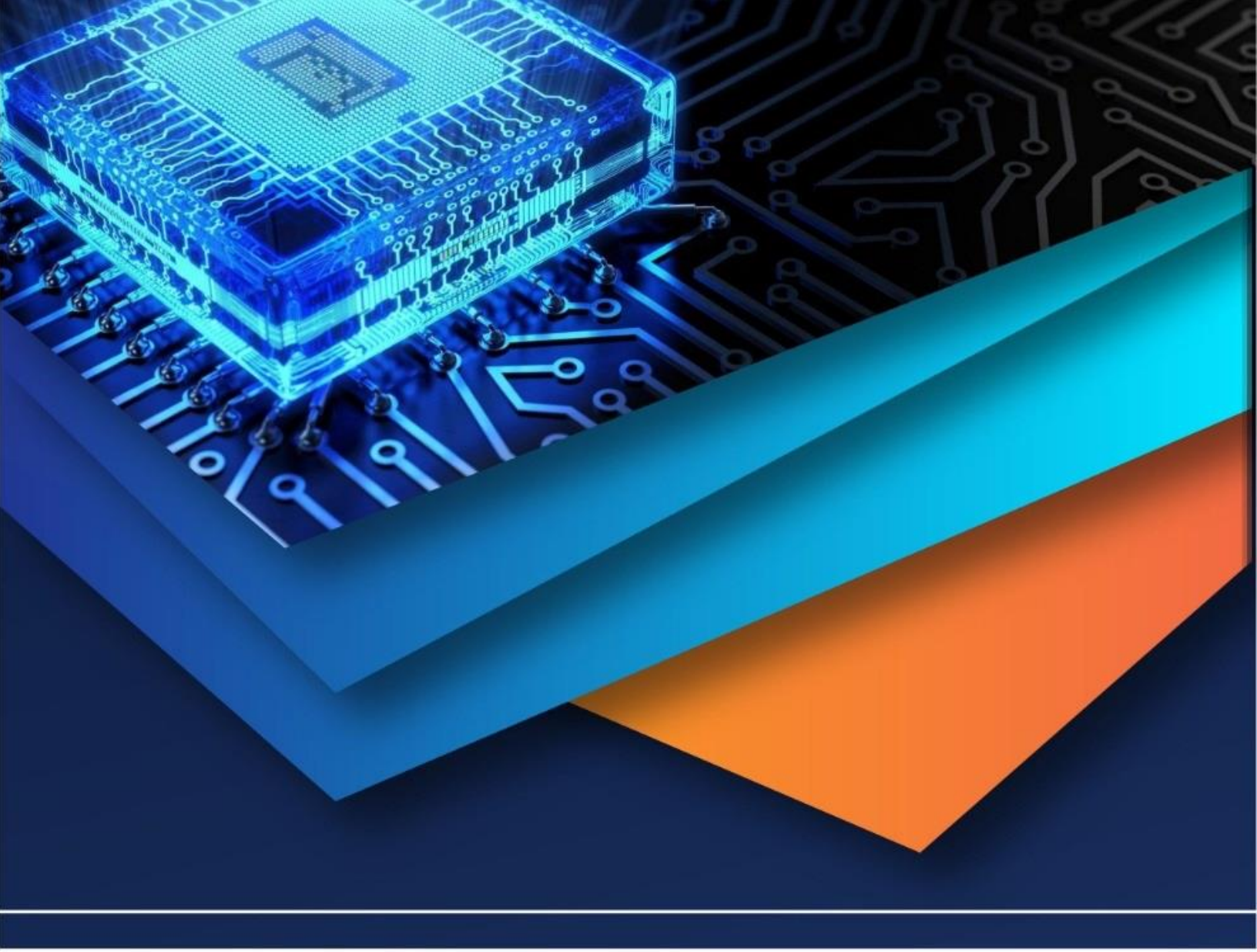
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