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Doctors Assistive System using Augumented Reality for Critical Analysis

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Abstract: *Surgeons are regularly on the lookout for technologies that will enhance their operating environment. They are often the early adopters of technologies that allow their field to offer a better surgical and patient experience. The continuing enhancement of the surgical environment in the digital age has led to a number of innovations being highlighted as potential disruptive technologies in the surgical workplace. Hospital collected by the sensors attached to patients once the sensor measured the values then it is processed and send to doctors augmented reality glass through wireless and alert if abnormal condition occurs. The doctor can take appropriate action based on the patient's current health condition.*

I. Introduction

Surgeons are regularly on the lookout for technologies that will enhance their operating environment. They are often the early adopters of technologies that allow their field to offer a better surgical and patient experience. The continuing enhancement of the surgical environment in the digital age has led to a number of innovations being highlighted as potential disruptive technologies in the surgical workplace. Augmented reality (AR) are rapidly becoming increasingly available, accessible and importantly affordable, hence their application into healthcare to enhance the medical use of data is certain.

Whether it relates to anatomy, intraoperative surgery, or post-operative rehabilitation, applications are already being investigated for their role in the surgeons. AR is the addition of artificial information to one or more of the senses that allows the user to perform tasks more efficiently. we propose a system in which important information forthe doctors are displayed on semi-transparent glasses includedin an AR-headset and therefore are mixed with the real-worldview.

Augmented reality (AR) is a term for the live direct or indirect view of a physical, real-world environment whose elements are augmented by computer-generated sensory input. The applications and related technologies for AR are attracting increasing attention from both the scientific community and companies originally involved in different research areas. In particular, the progress achieved in the fields of computer vision and mobile computing are mainly shifting the focus towards the development of systems for AR for mobile devices . AR is thus creating newer and newer opportunities for exploring the mechanisms of interaction between humans, and virtual and physical environments.

However, even if in strong expansion, the current state of the art of AR technologies and applications is still below market expectations, especially when considering the quality of the interaction offered. While some aspects, that are closely linked to the AR technology (i.e. marker-tracking, rendering, etc.), are gradually evolving, on the other end, there are still several aspects, both technical and social, requiring further investigation. One of these aspects is the creation and analysis of appropriate interaction techniques for AR applications, which allow the user to interact with virtual content in an intuitive manner. It is possible to explore the development of new interaction techniques in different directions including: ubiquitous computing, tangible computing and social computing. In ubiquitous computing, we can analyze the interactions with the user and its activities, within a dynamic environment.

II. Embedded System:

An embedded system is a combination of computer hardware and software, either fixed in capability or programmable, designed for a specific function or functions within a larger system. Industrial machines,

agricultural and process industry devices, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines and toys, as well as mobile devices, are possible locations for an embedded system. Embedded systems are computing systems, but they can range from having no user interface (UI) for example, on devices in which the system is designed to perform a single task to complex graphical user interfaces (GUIs), such as in mobile devices. User interfaces can include buttons, LEDs, touchscreen sensing and more. Some systems use remote user interfaces as well.

Embedded system hardware (microprocessor-based, microcontroller-based)

Embedded system hardware can be microprocessor or microcontroller-based. In either case, an integrated circuit is at the heart of the product that is generally designed to carry out computation for real-time operations. Microprocessors are visually indistinguishable from microcontrollers, but while the microprocessor only implements central processing unit (CPU) and, thus, requires the addition of other components such as memory chips, microcontrollers are designed as self-contained system. .

Microcontrollers include not only a CPU, but also memory and peripherals such as flash memory, RAM or serial communication ports. Because microcontrollers tend to implement full (if relatively low computer power) systems, they are frequently put to use on more complex tasks. For example, microcontrollers are used in the operations of vehicles, robots, medical devices and home appliances, among others. At the higher end of microcontroller capability, the term system on a chip (SoC) is often used, although there's no exact delineation in terms of RAM, clock speed and so on.

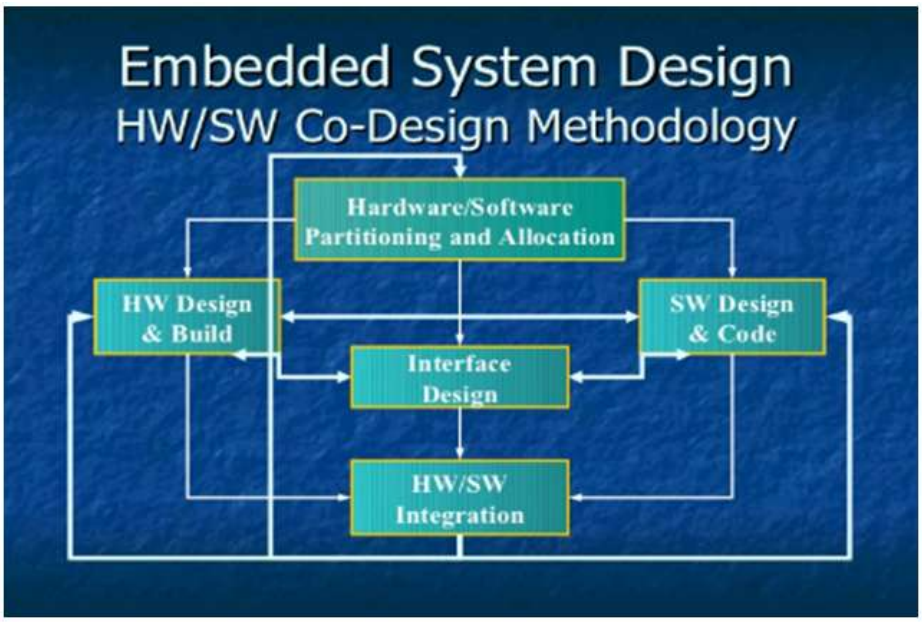
The embedded market was estimated to be in excess of $140 billion in 2013, with many analysts projecting a market larger than $20 billion by 2020. Manufacturers of chips for embedded systems include many mainstays of the computer world, such as Apple, IBM, Intel and Texas Instruments, as well as numerous other companies less familiar to those outside the field. Arm has been a highly influential vendor in this space. The company began as an outgrowth of Acorn, a U.K. maker of early PCs. Arm chips, produced under license by other companies, are based on the reduced instruction set computer (RISC) architecture and are often used in mobile phones; they remain the most widely deployed SoC in the embedded world, with billions of units fielded.

Embedded system software:

A typical industrial microcontroller is unsophisticated compared to the typical enterprise desktop computer and generally depends on a simpler, less-memory-intensive program environment. The simplest devices run on bare metal and are programmed directly using the chip CPU's machine code language.

Embedded Firmware:

The firmware on embedded systems, referred to as embedded firmware, is specific software written into the memory of a device that serves the purpose of ROM, but can be updated more easily. Firmware can be stored in non-volatile memory devices including ROM, programmable ROM, erasable PROM or flash memory. Embedded firmware is used to control various device and system functions, for example, telling the device how to communicate with other devices, perform specific functions and provide input and output functionality.



Proposed System

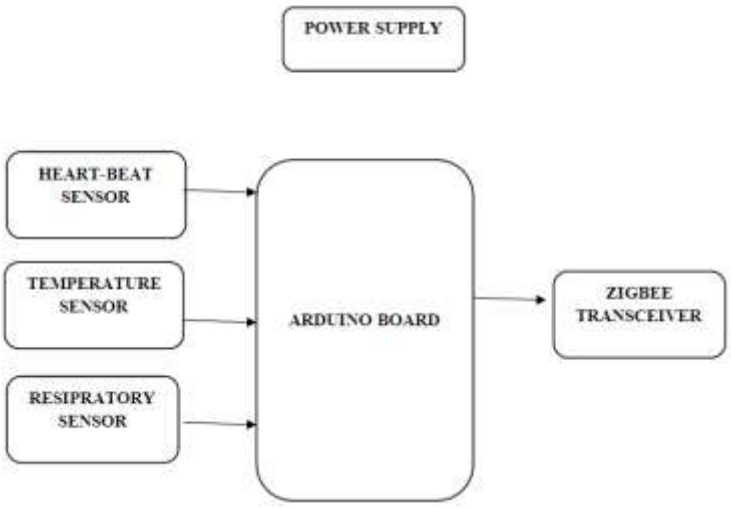
We propose a system in which important information forthe doctors are displayed on semi-transparent glasses included in an AR-headset and therefore are mixed with the real-worldview.

In this project, the real time data of patients in hospital collected by the sensors attached to patients once the sensor measured the values then it is processed and send to doctors augmented reality glass through wireless and alert if abnormal condition occurs . The doctor can take appropriate action based on the patients current health condition.

- The main contribution is securely distributing the patient data in multiple data servers and employing the cryptosystems to perform statistical analysis on the patient data in AR Glass.
- Embedded Technique has implemented in real time Argument Glass.

Block Diagram

Transceiver Model:



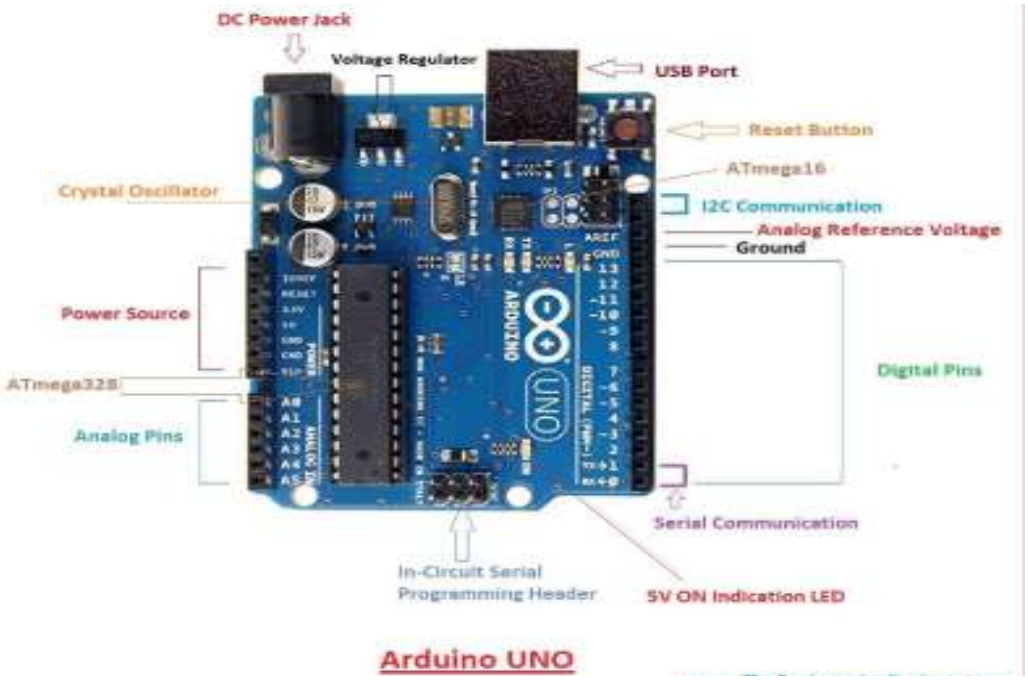
Power:

VIN. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

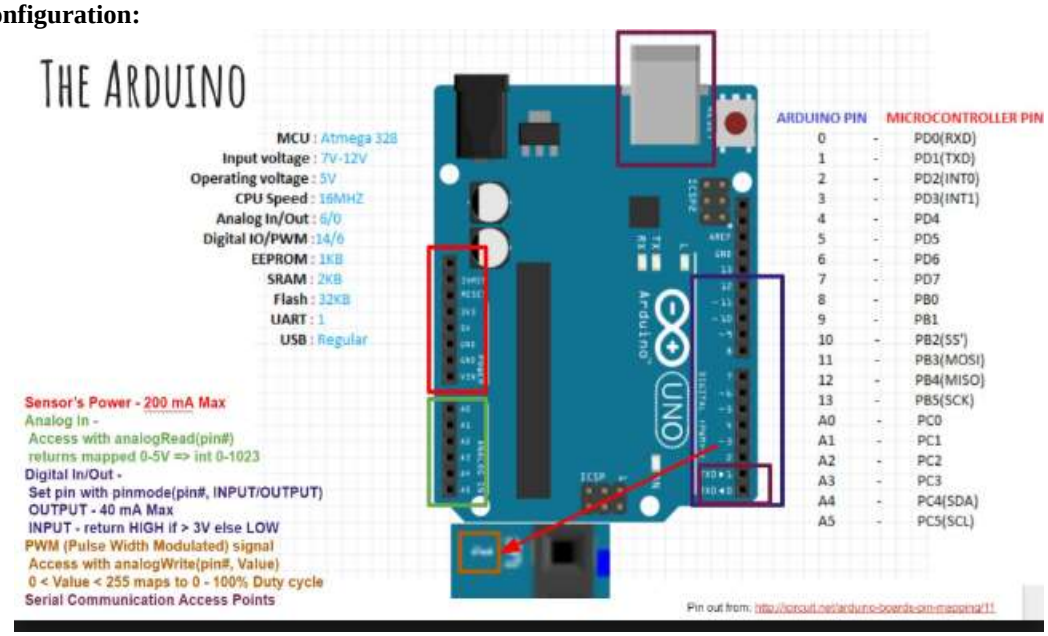
- 5V. this pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise it.
- 3V 3. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
- GND. Ground pins.

ARDUINO UNO:

Memory



Pin Configuration:



Usb Over Current Protection:

The Arduino Uno has a resettable poly fuse that protects your computer's USB ports from shorts and over current. Although most computers provide their own internal protection, the fuse provides an extra layer of protection. If more than 500 mA is applied to the USB port, the fuse will automatically break the connection until the short or overload is removed.

Physical Characteristics:

The maximum length and width of the Uno PCB are 2.7 and 2.1 inches respectively, with the USB connector and power jack extending beyond the former dimension. Four screw holes allow the board to be attached to a surface or case. Note that the distance between digital pins 7 and 8 is 160 mil (0.16"), not an even multiple of the 100 mil spacing of the other pins.

III. Conclusion

In this paper we have shown the main features of the architecture of a tool for the rapid prototyping of AR applications for medical purpose. The advantages that this new tool is expected to provide areRapid prototyping in an augmented environment. • Development of new interfaces (metaphors) of interactions for particular contexts. • Possible development of new formal techniques to "predict" and model user interactions. There are several possible scenarios in which the proposed tool can be used. Among these we can assume prototyping and simulation of user interactions with different environments such as mobile shopping (viewing and purchase of goods in a shop "augmented" with interactive elements), and mobile museum, in an interactive augmented museum tour.