M.A.V : Medical Analyzer in AR

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INTRODUCTION

According to a recent report, India produces approximately around 50,000 new doctors each year. And with so many doctors trying to practise and achieve expertise in their respective fields, the number of subjects on which they can practise surgery is an alarming low number. Every other day we come across disaster stories of medical frauds that lead to loss of precious human lives. This loss of lives also comes due to the fact that sometimes the monitoring devices used in the hospitals are quite old and don't function properly. This might be disastrous in some situations more than the rest. Our project aims at reducing these problems by providing doctors with an advanced, state of the art mechanism to monitor the patient's bio-signals or vitals as they are called. Also, with machine learning integrated into our VR app for various object detection, focusing primarily on human anatomy, our module would try to provide a way for the amateur doctors to get a first-hand and detailed knowledge of the instruments used in an operating theatre thereby reducing the scope of errors.

OBJECTIVE

- To design and prototype a device that acts as a "Virtual Monitoring Assistant" by providing customizable information of the patient's vitals.
- To have object detection integrated well inside the application to provide seamless knowledge of the object at first glance.
- Reduce the need for monitoring systems in hospitals replacing them with the VR versions of the same.

MATERIALS AND METHODS

Our Approach

Collecting analogue data from Pulse Sensor which has been connected to the Arduino. Converting it into digital form. Reading this from Unity using a C# Script and displaying an average as well as graphical representation of data over a 3D Image of Skeleton and Heart.

Dataset Used

For Object Detection, Common Objects in Context (COCO) dataset has been used and trained using Mobile Net V1 Model (SDD).

Implementation

- Collecting analogue data from Pulse Sensor which has been connected to the Arduino.
- Converting it into digital form.
- Reading this from Unity using a C# Script.
- Displaying an average as well as graphical representation of data over a 3D Image of Skeleton and Heart
- Using COCO Dataset for Object Detection.

System/Technologies Used

- Arduino Genuino Uno
- Pulse Sensor
- Unity Game Engine
- Python

RESULT

Hence, in this way we have created a M.A.V (Medical Analyzer in AR) which gives the facility of monitoring the patient's vitals using a state of the art technology. This also combines the feature of Object Detection based on COCO Dataset. Also it provides an economical way and an error free way of analysing the patient's condition over the conventional methods of vital monitoring currently present.

BENEFITS

- Customizable
- Multitasking
- User Friendly
- State of the art

REFERENCES

Arduino Forum :
https://www.arduino.cc/
Unity Guide :
https://www.unity3d.com/

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