Design and Development of an Educational Environment for Industrial Automation Devices by Using Augmented Reality

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ABSTRACT

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In our project, we used the application of augmented reality (AR) in order to developing designing educational application. In the research we concentrate on application learning machine system of Siemens Industrial Automation Devices how to use will be possible for users without any human help.

For development of application, we are using sources which are OpenCV and Vuforia. For our case, improvement of our application is related with Vuforia because we want to provide enhanced reality to create real environment. Interface of Vuforia is good for the interaction with users. Hence, for our research about AR and we integrated Vuforia with Unity tools. With Unity tools we can able to design AR system.

OBJECTIVES

Designing and developing of an educational environment for industrial automation devices by using Augmented Reality.

PROJECT DETAILS
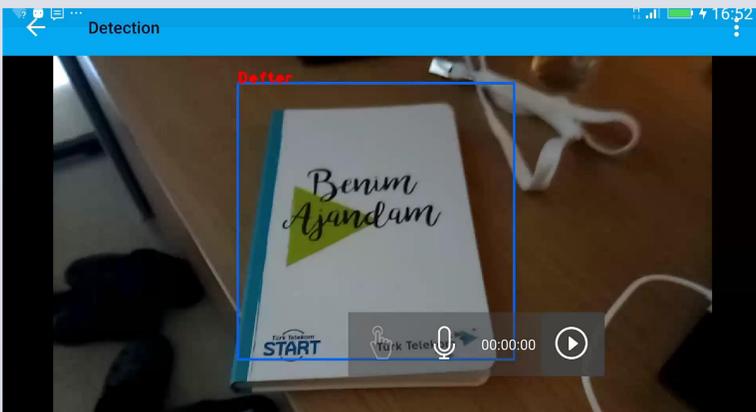
In first part of the project we tried to develop our application with OpenCV library. To achieve image recognition we needed to train a file named cascade classifier. We tried to recognise various images. We were able to detect the images but results were not good enough. We needed to use few hundred images to train a good classifier. But on the other hand with vuforia we can track objects by using only one image so we decided to use Vuforia.

PROJECT DETAILS II

In the second part the main plan is that we decided to use Vuforia to write our application. While we were writing the first part there were three possible programs: OpenCV, Wikitude, Vuforia. We decided not to use OpenCV because it was not applicable. We decided to use Vuforia as it is easier to develop for new users. According to project timetable, we finished the literature research, divide progress into parts and considered legal procedures and ethical issues as planned. Instead using PLC we used EV3. We used EV3's image as an image tracker in Vuforia. Then in Unity we put our virtual onscreen button models on top of the image tracker. By pressing the buttons on the screen we can show information related to the EV3.

CONCLUSIONS

We implemented augmented reality in our application. We are able to show virtual onscreen buttons. To design and develop our application we integrated Vuforia with Unity tools.We can show information about our device with using augmented reality. We satisfied our objectives.

REFERENCES

OFFICIAL PARTNERS

http://docs.opencv.org/
https://developer.vuforia.com/
https://unity3d.com/unity/editor
https://www.lego.com/en-us/mindstorms