

GESTURE RECOGNITION USING SIXTH SENSE TECHNOLOGY

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Abstract - The aim of this project is basically to bridge the gap between the physical world and digital world. The project is software based in which user hand gestures are recognized through web camera and then the related information augments in the real world via projector. Through this paper, theoretical explanation of this project is explained and also how the software works and runs in real environment. The coding part is done on microsoft visual studio software through which built-in camera can be accessed for recognition of hand gestures. This project is similar to the Sixth sense technology of Pranav Mistry, MIT Media Lab student. In this project we are presenting one module of this technology.

Key Words: image processing, gesture recognition, camera, digital information.

1. INTRODUCTION

In this era of modernization, technologies are advancing rapidly. Every day we see some new technology coming in market to simplify our lives more than ever. 'SixthSense' is a wearable gestural interface that augments the physical world around us with digital information and lets us use natural hand gestures to interact with that information. 'Sixth Sense' is wearable gestural links that build up the substantial and real world around us with digital information and lets us use natural hand expressions and gestures to connect and communicate with that information [2].

We've grown over millions of years to feel the world around us. When we confront something, someone or some place, we make use our five organic senses to differentiate information about it; that information helps us make decisions and chose the right actions to take. But arguably the most useful intelligence that can help us make the right judgment is not naturally cognitive with our five common senses, namely the data, the information and the knowledge that humankind has acquired about everything and which is progressively all accessible online. Although the decrease of computing devices allows us to carry computers in our pockets, keeping us constantly connected to the digital world, there is no channel between our digital gears and our communication with the physical world. Information is limited normally on paper or digitally on a screen. Sixth Sense overpasses the gap i.e., bringing unreal and abstract, digital information out into the touchable world, and allowing us to connect with this information via natural hand gestures.

1.1 Camera: the camera (see Figure 1) is the key input device of this system. The camera attached is used to capture the images to which the user is looking at. It tracks the gestures made by the user. The camera recognizes individuals, images, pictures, gestures that user makes with his/her hands. Then the captured image or data is sent to the mobile computing device for processing [8]. Camera in this system acts like a digital eye which connects to the digital world of information.[8] It integrates the digital information into our real world through our own made hand gestures.



Figure 1. Camera

1.2 Projector: the interpreted data is projected onto a surface mainly walls, body or hands of a person for augmenting the digital information in the real world [8]. A tiny LED projector(see Figure 2) is used for projecting the virtual info which has a small battery last for 3 hours. The image captured by the cameras and processed by the mobile device is projected onto the small mirror located below it. So that when an object is touched, the related info is being augments on a surface via internet ,as it is a part of that object.



Figure 2. Mini Projector

2.3 Microsoft Enabled Laptop: The laptop(see Figure 3) is used for implementing the code and running the software. The code is written in C# language for about more than 10,000 lines of code. The laptop in which Microsoft visual studio software is enabled used for processing the data or image captured by the camera. This digital info is then passed to the projector which projects the info of the object considering as if it is the part of that object.



Figure 3. Laptop

2.4 Mirror: The mirror(see Figure 4) is used to reflect the image or any digital info projected by the projector onto a desired surface. It is located below the projector in the system[8]. The user manually can change the tilt of the mirror to change the location of the projection. Mirror finally augments the digital world info on the physical world so that one can build up the gap of virtual n real world. This is the final step which frees the digital info into real world. Thus, the mirror in the Sixth Sense helps in overcoming the limitation of the limited projection space of the projector.



Figure 4. Mirror

2. WORKING

WORKING PRINCIPLE

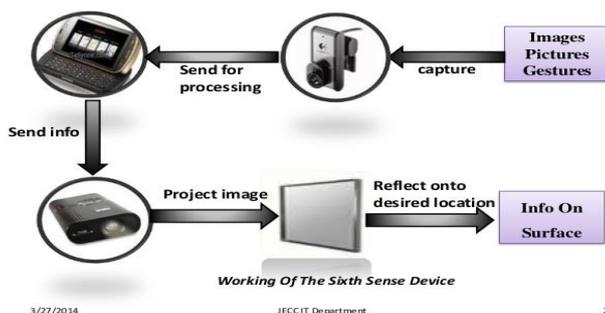


Figure 5. Working of Sixth Sense Device

Sixth sense technology is WUW i.e. Wear Ur World technology which is a pendant like wearable device. It consists of a camera, a mirror, color markers, colored tapes and a projector connected wirelessly to the Bluetooth or wifi of smart phone [5]. The hardware that makes Sixth Sense work is a pendant like mobile wearable interface. It has a camera, a mirror and a projector and is connected wirelessly to a Bluetooth smart phone that can slip comfortably into one’s pocket. The camera recognizes individuals, images, pictures, gestures one makes with their hands. Information is sent to the Smartphone for processing [9]. The downward-facing projector projects the output image on to the mirror. Mirror reflects image on to the desired surface. Thus, digital information is freed from its confines and placed in the physical world[10].

3. CONCLUSION

We have discussed about the latest innovative argot that has announces its existence in the technical field, it recognize different varieties of actions and gestures, it can easily interact with other objects. Sixth sense technology definitely will going to bring up a great and wide change in the way we look our world that’s why this technology must have a bright future. The main advantage of this technology is that, it is portable as well as interactive than any other device like laptop, Smartphone, tablets etc. In this report we have also discussed about applications, disadvantages and advantages of sixth sense technology as well. This new technology has a wearable device that authorizes us to have the entire world of advanced data readily which is truly available. The masterstroke of this technology is that it has the potential that holds to connect INTERNET with real world and superimposing the data on the real-world. The key point is that it identifies the objects around oneself, let us access the information in that way we have discussed displays and want that particular information as well, all these in the most simplest way[9].

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