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RESEARCH ARTICLE

Oculus Wearable Technology -Vision for Blind

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Abstract— Oculus is a wear able head mounted energy efficient glass, meant only for blinds. This paper urge that Oculus's birth is not only a marketing phenomenon heralding a technical prototype but also a ray of hope and speculates that Oculus's popularization. It can be a an instigator for the adoption of a new paradigm in BLIND-human-computer interaction, the wearable virtual eye, giving some basic functionalities such as A-GPS/GLONASS for navigation, voice calling, interaction with phone contacts & messages by speech input as well as output. Embedded with APD (Avalanche Photodiode) used for detecting traffic signal lights, and with Ultra sonic sensors to detect the position of the object in front. As far security is concerned the device comes with one time device patch-up and voice based activation, and also anti-theft technology. This oculus will have the combination of virtual reality and augmented reality.

Keywords— Virtual eye; APD; A-GPS; GLONASS; Blindness

I. INTRODUCTION

Wearable technology refers to little gadgets and devices that can be used use on human body as clothing or accessories which integrate computer and advanced electronic technologies and carry out practical functions and features. Visualize a watch that tracks your level of physical activity, or a device that you wear on your arm to gauge your golf swing, or a pair of socks that tells you about your pulse, weight distribution and foot landing when you're running. All of these would be defined as wearable technology. "Wearable computing" is the new buzzword in how we're going to live our lives. It might even free us from what Charlie Brooker called the "black mirror" of our Smartphone screens, the ones that seem to grip us to the exclusion of all else when we're walking down streets, waiting for transport, or even hanging out with friends. Even if our thought is slightly distracted by the wealth of information being screened in front of us, we would no longer be frequently looking at our phones for responses [4].

The idea of wearable computing has been more or less for a few decades; but it's only recently that phones have attained enough computing power; data connectivity has become pervasive, Bluetooth connections low-powered enough and screens cheap enough.

In 2000 Alexander Pentland, a professor at MIT who helped set up its famous Media Lab and has for years been interested in wearable computing, wrote an article for the Association of Computing Machinery in which he noted that "inanimate things are coming to life", but, subsequently, more like Walt Disney than Frankenstein wrote , "The simple objects that surround us are gaining sensors, computational powers and actuators ".

Blind Oculus, a wearable energy efficient head Mounted oculus meant for the people suffering from permanent blindness. Discarding about the functionalities in detail, the voice inputs given through a mice bedded in oculus at the right, used for activation of oculus and giving commands to the oculus such as, sending messages, calling, finding directions. This oculus uses **Bone Conduction** technology to provide the user with the voice output, such as receiving of call & reading out the messages.

II. COMPONENTS AND FUNCTIONING

Basic components of the oculus are:

1. Micro Solar cells.
2. Capacitors.
3. 600mAbattery.
4. BluetoothV2.2
5. A-GPS
6. Microphone & Earphone
7. Camera- 5MPwith10xzoom.
8. APD sensors
9. Ultra sonic sensors
10. 1GBRAM with dual-core processors

Micro solar cells: As it is said, "Thinner the solar cell becomes, the easier is to extract electricity." Following this concept there is huge demand to build the nano sized solar cells. Ugle stad micro beads appear to be one of the best options in this technology. For those that don't know, Ugle stad micro beads are very small plastic sphere so fan exactly uniform size that have a variety of different uses, and strange characteristics[1]. Forcing the Ugle stad micro beads toliec lose to get thereon the silicon surface, in an almost perfect periodic pattern, where micro beads can be used as a mask. Lasers can then be used to etch indentations around the micro beads as shown in figure 1.

Fig 1 : Microbeads

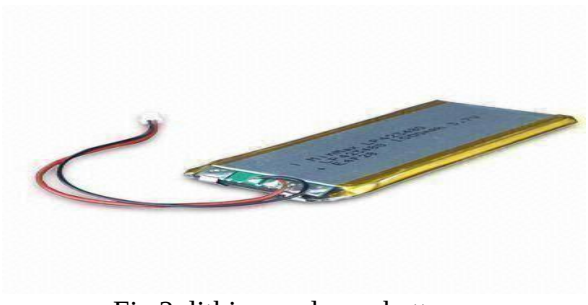

Fig 2 :lithium polymer battery

These solar cells make it a energy efficient oculus which can provide enough back up for different functionalities throughout the day.

Capacitor: To store the energy produced by the solar cells we need to have a capacitor in the oculus. A capacitor is a passive two-terminal electrical component used to store energy electro statically in an electric field. This feature of the oculus makes it the most energy efficient oculus[6].

Battery: Lithium-ion polymer batteries ,polymer lithium ion or more commonly lithium polymer batteries are rechargeable (secondary cells) batteries as shown in figure 2. Li-pobatteries are usually composed of several identical secondary cells in parallel to increase the discharge current capability, and are often available in series "packs" to increase the total available voltage [5]. This type of technologically has evolved from lithium – ion batteries. The primary difference is that the lithium- salt electrolyte is the ldinan organic solvent but in a solid polymer composite such as poly ethylene oxide or polyacrylonitrile. The advantages of li-ionpolymer over the lithium-ion design include potentially lower cost of manufacture, adaptability to a wide variety of packaging shapes, reliability, and ruggedness, with a disadvantage of holding less charge[2].

Assisted GPS and GLONASS together are used to provide an accurate navigation. Assisted GPS, generally abbreviated as A-GP Sor a GPS, is a system that can under certain conditions improve the performance or time-to-first-fix Global Navigation Satellite System. Also used in space-based satellite navigation system operated by the Russian Aerospace Defense Forces. It provides an alternative to Global Positioning System(GPS) an this is the only alternative navigational system in operation with global coverage and of comparable precision [3] explained in fig 3a,b,c.

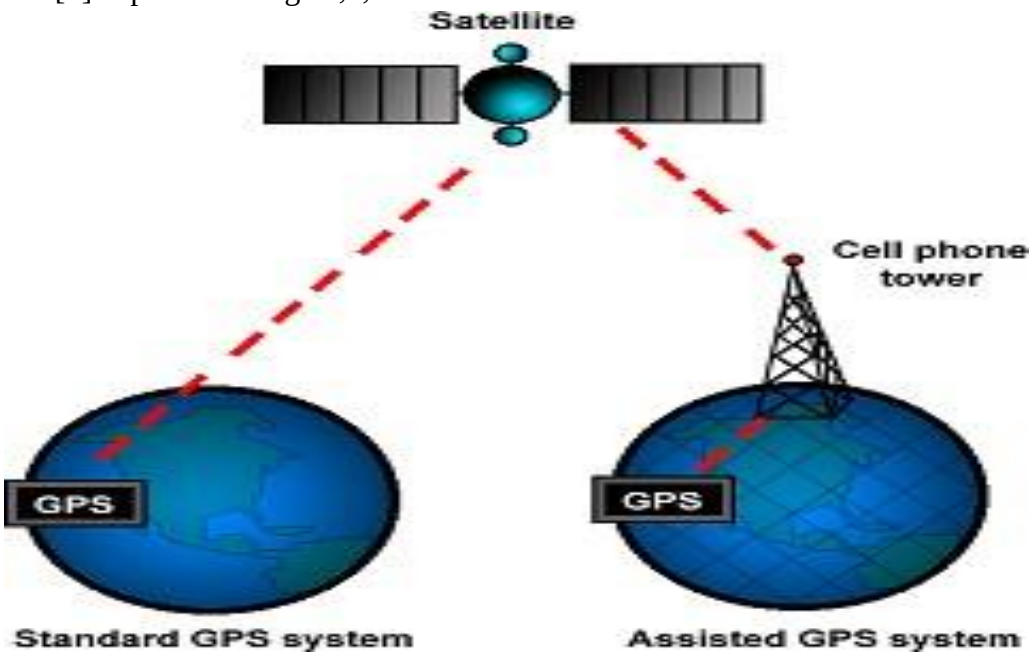

Fig 3 a: Global Positioning System

GLONASS(Global Navigation Satellite System)is a space based satellite navigation system operated by the Russian Aerospace Defense Forces. It provides an alternative to Global Positioning System (GPS) and is the only alternative navigational system in operation with global coverage and of comparable precision.

Fig 3 b: Global Positioning System

GLONASS Used alone is therefore very slightly accurate than GPS [7]. On High Latitudes GLONASS accuracy is better than GPS, due to the orbital position of the satellites. Some modern receivers are able to use both GLONASS And GPS satellites together, providing greatly improved Coverage in urban canyons and giving a very fast time to fix due to over 50 satellites being available. In indoor, urban canyon or mountainous areas, accuracy can be greatly improved over using GPS alone.

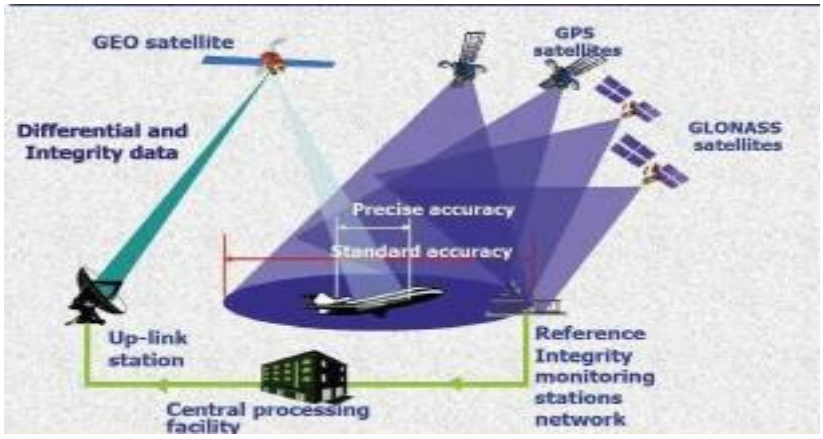

Fig 3 **c**: Global Positioning System

An avalanche photodiode (APD) is a highly responsive semiconductor electronic device that exploits the photoelectric effect to convert light to electricity [8]. APDs can be thought of as photo detectors that offer a built-in first stage of gain through avalanche multiplication. From a functional standpoint, they can be considered as the semiconductor analog to photomultipliers.

III. WORKING AND FUNCTIONALITY WITH SECURITY

The working can be explained with a real time scenario of a blind person who intends to reach out hotel. How would the oculus help him? The oculus comes with text to speech converter and vice versa with which a blind person can hear or receive the messages and calls and can command the oculus to execute various functions. If the blind person has to go to some place the A-GPS with GLONASS will navigate him to his destination and the best part is that it does not require any data connection to navigate. The person while moving across many traffic signals, he may get a secure and safe path we embedded oculus with ADP sensors as well as ULTRASONIC sensors so as to detect the signal color and the objects present and their distance from the person. This all will be carried through the microphones (used for giving commands)and ear phones with BONE CONDUCTION TECHNOLOGY to provide clear and better hearing even in loud noise Outside[7]. After reaching hotel to read out the menu the camera views it and the converter converts it into speech format and read it to person [8].

The oculus comes with a onetime patch up which will provide the best and protected way to connect with the device. As oculus only uses Bluetooth to communicate with the device and the data is encrypted before it is **transmitted** to make stealing impossible as a signal is generated to the device that results in locking automatically [5]. In order to deal privacy concerns of other people in the society, it implements a function in oculus which doesn't allow the user to save any type of image or a record. Oculus comes with an Anti Theft technology which makes the device more secure from theft attacks.

Chief concerns of wearable technologies

Selectability and Adoptability : The precision, relevance and forte of the worth proposition to shoppers is very significant for acceptance; there are various an identical devices available in the market and customers are usually now not that aware of this category of units and services, making choice a probably very tediuos.

Design: The Bulk or wearable gadgets are designed to be sported visibly, so it can be crucial for producers to design such products so that consumers would wear it on a regular basis. .

Out-of-Box and Setup Expertise: Some Individuals are easily intimidated with the aid of new expertise, so you will need to understand that for mass adoption, wearable tech must be easy to make use of right out of the Field. Elder individuals tend to keep away from products that entail them to learn a handbook on how to begin the practice on the device. Sensitive design would be the is key.

Good Quality and Robustness: Most wearable tech units are meant to be worn 24/7, which means robustness is a essential. Wearable gadgets should be designed to stand an excessive level of wear and tear, and enhancements like water-proofing will help consumers.

Expertise: The Consumer Experience should be directly intuitive, acquainted and faultless. It should transcend the instrument, the cellular app, net-services, and general enhance.

API / Integratability: Wearable tech will have to also be developer pleasing, as this group of people is chargeable for developing more helpful and engaging apps. Moreover, wearable tech will have to make stronger APIs to share information and services with a view to present a compelling ecosystem for End users.

Compatibility and Standard: People at all times are on move, so it can be crucial for wearable tech to be ready when the Person is. This involves devices to have an extended battery life and should be water-proof, so the Person doesn't have to cast off the software as ceaselessly. If a tool cannot be worn for quite a lot of hours because of its deprived battery lifestyles, a consumer will soon abandon the instrument altogether.

Utility aspect: The Purpose of a device is very central. If the principle goal of the wearable device is to assist a person in vision, the instrument should be capable of contextualize for this purpose.

IV. CONCLUSION

The oculus embedded with latest technology with gadgets and is capable of helping disabled people. The advanced GPSs system with GLONASS makes this device to position correct without the use of any kind of data connection and internet. Pre loaded maps will be given to user so as to navigate to its place. These gadgets witness more energy efficiency, as it is coated with micro solar cells all

over the frame to charge the cells time to time. This device is embedded with powerful ram and a minimum of dual core processor to make the device much faster. With the advent of such socially relevant system the people at large would be benefited in the areas of physical/vision disability, military application, traffic regulation and critical medical treatments and also showcases minimal human interventions with yet best results.

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BIOGRAPHIES

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