

I am going to talk to you about DIY Project Glass and the next generation. At the moment, this is one of the exciting and one of the fastest growing areas in new technology. For those of you who don't know what Project Glass is, Google released a video in this Summer showing this future technology in which eyeglasses replace many smart phone functions. In the experimental stages which started this year, the capabilities include identifying physical locations voice and video calls, GPS navigation, sending/receiving messages, taking notes, as well as snapping and sharing photos and video.

#### Agenda

- Project Glass Inspired
- Applications
- Implications
- What is underneath?
- True AR Glasses

@WillPowellUK willpowell.co.uk

So, I'm going to talk about the work I have been doing that has been inspired by project Glass. I'll talk about possible applications and give you some examples of how I have been using the technology. I'll look at the implications for both the developer and all for the users of the applications. Then I'll deal with in more detail what technology is used to get these experiences and finally I'll talk about by true Augmented Glasses.

So, first of all I am going to show you my initial response to the Google Project Glass video that was released this year and had 200 thousand views in a week. I used Vuzix glasses, HD Webcams and a mic headset, all readily available off the shelf items. My application is written in Adobe Air because it is a very fast to develop in this language and easy to bring in native code. I included real time speech recognition. I am now going to show you my first application where in the glasses I superimpose information on what I am seeing in real-time. I made the application copy the output which was being shown to me in the glasses to disc so that it can be shared with you on the video.

## Project Glass One Day.... alpha (inspired) WATCH VIDEO NOW

<u>@WillPowellUK</u> willpowell.co.uk



## Project Glass Inspired Through the glass clip WATCH VIDEO NOW

<u>@WillPowellUK</u> willpowell.co.uk

Just to recap, Here you can see the kit I used in the top picture, the bottom picture is what I saw in the glasses when I was reading the magazine and asked about the weather.

To give you a better idea of what you actually see on the glasses, I have another short clip, it is difficult to get a camera to focus on this, but you can see the start sequence from the previous video.

#### A Few Applications

- Navigation
- Weather
- Calendar
- Appointments
- Taking photos
- Send emails
- Sharing location
   Contacts
- Translation

- Price checking
- Shopping
- Tweeting
- POI information
- News feeds
- Sports info
- Radio

- Transport info
- Vouchers
- Reminders
- Clock
- Alarms
- Albums
- SMS
- Video call

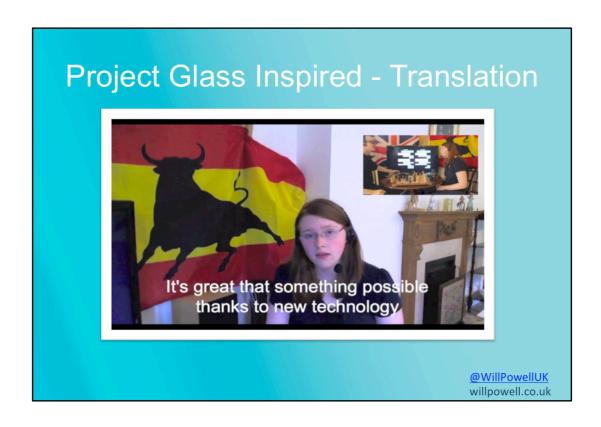
@WillPowellUK willpowell.co.uk

Moving on here are some of the applications I came up with, this is not an exhaustive list but as you can see it is very similar to what you would expect from a mobile phone. We showed weather, calendar, appointments and photos, both taking and sharing in the video I have shown you. Just to pick out a couple more, such as shopping, when you are out and about you can ask where the nearest shop of a particular type is and get instructions on how to find it. I for one check my phone for transport updates and it would be great to have continuous information in my peripheral vision.

One of the ideas that particularly interested me is translation. My sister actually speaks Spanish and I thought a great application would be to take film like subtitles and put them on real life conversations. So I made it, and I managed to have a conversation with her without speaking the same language and real life subtitles provided in white text at the bottom of my vision. My application can actually translate between 38 different languages. The application could be developed for use fo example in video conferencing. It has been suggested to me that when there is a major disaster with international volunteers going out to help, one day they could use such technology to speak to the local people they are trying to help. I'll show you the video.

Project Glass: Translation...inspired
- subtitles in glasses
(English Spanish conversation)
WATCH VIDEO NOW

<u>@WillPowellUK</u> willpowell.co.uk



This technology has so many applications and really knocks down barriers of communication across the globe.

#### **Implications**

- Always on
- My senses are the input
- Truly hands-free
- Security

@WillPowellUK willpowell.co.uk

But what are the implications with this technology. Firstly the device is always on, applications are not so much started and stopped separately they are always on together. Things like voice recognition will have continuous input.

Secondly we are now taking a device and adding it to our senses. The screen provides me with additional content in my field of vision. With the translation idea we are seeing the system is picking up what I am hearing to add it to my vision as a sensory overlay.

The devices are truly hands free. In my first video I was able to take a photo, check the weather, make an appointment all without putting down the magazine I was looking at. This does open the question of how interfaces will work because this is the first time we are not interacting with a static 2D plane as we do for tablets and mice. The screen is now relative to us and our environment all the time. Finally security, always a difficult point. With glasses based technology security gets more complicated because it can see and hear everything I can. With the translation concept earlier, it is useful that it can remember conversations but that is very private information and would you like someone to be able to search that information?

#### What is underneath?

- Voice Recognition (Dragon, Sphynx...)
- Glasses Display
- Camera
- Microphone
- New small devices (Raspberry Pi...)

@WillPowellUK willpowell.co.uk

The technologies that actually makes this work relies on the hardware of glasses, cameras and microphones to make the content relevant the voice recognition provides the backbone. There are lots of sdks and hardware out there already and with the sudden influx of the small computer it is even easier to get started. But what about bringing full augmented reality to glasses head up displays. A way to bring virtual objects to life.

At keytree we have been looking and doing just this. Using multi camera markerless recognition and glasses displays and cameras we set about creating a fully immersive augmented reality system.



Our first Concept was around constructing your dream kitchen on top of an iPad. Quite literally on top of it. The iPad provides a base with controls that the user can interact with and the glasses overlay the iPad with a fully 3D stereoscopic, which is different images in each eye to give true 3D experience. A user can change the floor, wall and surfaces by interacting with the iPad and the 3D rendering on top of it sticks to the iPad and adjusts accordingly.

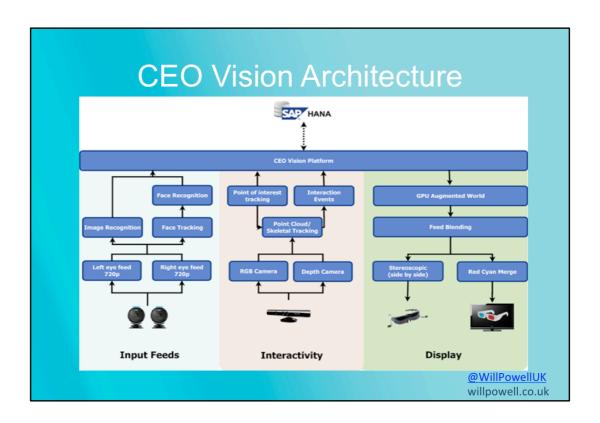
We didn't stop there. We wanted to do away with the iPad and create true augmented spatial operating system that means you could interact with something as simple as a piece of paper. I am going to show you an excerpt from a video of our concept CEO Vision. We join the video looking at a pharmaceutical business report, view from the glasses at the paper document and we are using a Microsoft kinect to track the user.

# CEO Vision - SAP HANA + Augmented Reality + Microsoft Kinect WATCH VIDEO NOW

<u>@WillPowellUK</u> willpowell.co.uk



That is CEO Vision we used it to take a standard report and make it dynamic and it was all around plain images that we brought to life. This award winning technology uses the glasses, cameras, Microsoft kinect to create a truly interactive experience.



Here is the architecture of how CEO Vision works. On the left we take the two video feeds perform object recognition, face recognition and tracking to them feeding into the core of CEO Vision. We then have the interaction feeds from the Microsoft kinect Infrared and rgb cameras in the center. This information is combined with SAP HANA which is a very fast in memory database. All of this information is processed and pushed out through glasses or to presentations screens for others to see the experience.

### What we are working on now

- CEO Vision gen 2
  - More interactivity
  - Better AR Experience
  - Unveiling 13<sup>th</sup> November in Madrid
- Virtual Supermarket
  - Demo in Las Vegas last week
  - Using Kinect
  - Winner SAP TechEd Demo Jam
  - Featured in National Press
     (The Independent, Daily Mail, Sun)

@WillPowellUK willpowell.co.uk

So we are now working on a new generation of CEO Vision in which we have more precise and detailed interactions like pinch and point, better AR experience through latest glasses and will be unveiling it in two weeks time.

In the virtual reality world we have create a whole new way of shopping, which I do have the video for.



You can find out more on my site willpowell.co.uk or tweet me WillPowellUK and I am more than happy to answer any questions.