The 22\textsuperscript{nd} Century Cell Phone

CS465 Homework 4
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*Oakley Half Jacket XLJ Fishing Sunglasses

\textbf{Audience}

This cell phone is designed for the cyclists, and possibly joggers and other moving exercisers.

\textbf{Motivation}

I enjoy biking a lot in the mountains or along the river. But during biking, carrying a cell phone is a burden and it's almost impossible to talk with a phone call. Cyclists normally need to stop, put on the Bluetooth headset, and then start talking. However biking, unlike many other sports, requires minimum usage of brain and focus, so it's a perfect combination to bike and talk at the same time. A pair of sunglasses, on the other hand, is standard equipment for cyclists; therefore the idea to embed cell phone functionalities in sunglasses appeared. Also taking pictures is a very useful feature for this communication device because cyclists often see beautiful views and it's even more inconvenient to bring a camera when people bike.

\textbf{The 21\textsuperscript{st} Century Product}

Motorola and Oakley had introduced RAZRWire, eyewear that offers wireless, hands-free connections to Bluetooth-enabled devices in mid-2005. This product aimed at allowing active users to quickly answer or place calls with the touch of a button. However, this device is giant compared with the volume and weight of the titanium sunglasses and it creates a sense of imbalance. The biggest disadvantage is that this device is simply a Bluetooth earpiece hanging on the
glasses. Users still need to carry a real cell phone with them in order to use this device.

**The New Design**

The first requirement for this sunglass communication device is that it should look and feel like pure sunglasses but has the fundamental cell phone functions – receiving and making a phone call. The current electronic sunglasses, such as Media Player Sunglasses by Thanko, are too big and do not look attractive at all. Thus, this cell phone needs to be totally integrated with sunglasses. Because it is designed for cyclists, it should be functional without holding something in hands. Also the operations need to be really easily and fast. One touch should do most, if not all, tasks. On the other hand, cyclists could speak, so sound-control is a good option when hand-control is not available. A button is still necessary because people are used to press a button to start or end a call, and it could avoid confusing voice commands. The button is used to change to phone call mode or photo mode; all other instructions are given by voice.

Therefore, the sunglasses need to have a hidden microphone and a stretchable earphone. The earphone is a part of the frame, maybe the end of it, and only when using cell phone functions should the users put it in ears. Otherwise it would look like a part of the frame.

**Scenarios**

There are totally three fundamental cell phone tasks and a photo-shooting task that are designed for the sunglasses.

**Scenario 1:** Pick up a phone - phone ring, inform who is the caller, then pickup or hang up the phone. A small part of the frame of the sunglass near the face will vibrate slightly, or a soft music plays to notify that there is a new phone call. Then the speaker or earphone says the caller's name or number. The user could then say "pickup" or "don't pickup" to control the call. If the user decides to use the earphone, he or she needs to stretch it to put in one ear. However, no button press is needed for this part. When the talk finishes, press button once to end the cell phone talking mode.

**Scenario 2:** Make a phone call - find the person or input a phone number, make a phone call. The user needs to press the control button on the frame one time to change to cell phone mode, and then say the name or number to dial. When the call is finished or canceled, pressing the button again to hang up. Totally two button presses are needed for this scenario.

**Scenario 3:** Update/Retrieve a contact's information. Users could use wireless connection with PC to update the address book, or long press the button to activate address book. If users choose to update address book directly, after the long press, spell the name and say
the number. The speaker or earphone would repeat the information and ask for oral confirmation. If the user only spell or speak the name, the device will try to find the number for the name and speak out the result (the number or could not find the person). Only one long button press is utilized in this scenario. Long button press might not be very easy during biking, but at the same time this action should not be performed frequently when the user is actually biking.

Scenario 4: Take photos. Press the button two times to activate the photo shooting mode. Ideally the mini camera would take a picture of the full view as what the eyes see. After entering the photo shooting mode, the speaker/earphone will count down and take a picture. If the user wants to cancel the picture, one press will cancel the shooting mode.

Every action described above is within 2 presses except when users start and then cancel the shooting mode. It uses voice control to fill in all other necessary information. The other design is for data transmission. For example, putting two sunglasses next to each other and make a long press would activate address book synchronization. With this very simple function, cyclists could wear different sunglasses everyday and always have the latest contact information.

There is security issue for the sunglass cell phone because it does not have a password protection. One possible solution is to use fingerprint identification at the beginning and end of sunglass using sessions (the biking duration, for example). With the fingerprint protection, only the owner of the sunglasses can access the contact information and the cell phone functionalities.

References

1. Oakley Half Jacket XLJ Fishing Sunglasses (the picture) http://www.sunglassgiant.com/oahajaxljfis.html