Course Report for 'Human-Computer Interaction II"

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THE FUTURE OF EYES INTERACTION ON SMART DEVICES

Abstract: Technology that makes it possible for individuals to use devices only with their eyes, acting as the mouse cursor on the screen and enabling standard phone functionality, eliminates the necessity for hand-based interaction. It would not only be more effective and simpler to use, but it may also enhance the immersiveness of using a smartphone with the future help of computer vision and deep learning with human-computer interaction.

Keywords: *Gaze Gestures, Motion Gestures, Computer Vision, Human-Computer Interaction, Deep learning, Artificial Intelligence.*

1. INTRODUCTION

An explanation of the service that the program must provide is contained in a functional requirement (FR). It describes a piece of software or a software system. A function is nothing more than the inputs, behavior, and outputs of the software system. A system's likely purpose can be determined by a computation, data manipulation, business process, user interaction, or any other specialized feature. In software engineering, functional specifications are another name for functional requirements.

2. DESCRIPTION

A. REQUIREMENT DISCOVERY

I asked three of my Cambodian friends, which the question is include as below:

1. Do you believe that in the future, people will be able to interact with their phones using their eyes rather than their fingers?
2. How long does it take?
3. Do you think some big tech company is working on it?
4. What do you think would happen if this was possible?
5. Can you tell me about the advantage?
6. Can you also tell me about the disadvantage?
7. Would it have an impact on the user's health?
8. If it affects health, then what is it?

Answer 1: LONGHOR MA

1. Possibly.
2. In 2030.
3. Yes.
4. An entirely new interaction program. It will not only interact with the phone, otherwise TV, PC, and other smart devices.
5. Convenience, unique feature/experience, a new proposal that could pursue by other businesses/corporations.
6. Require high learning ability for the user, might predict inaccurately (Will get better time by time).
7. Yes.
8. Possibly on eyes.

Answer 2: VEASNA RATHANAK

1. Well, I think it’s possible to happened in the future. Sound like future innovations have been predicted. Flexible, bendable and foldable phones are expected.
2. In 2028, I think.
3. Yes, for sure.
4. And another about technological advances is capable of projected holographic are another idea. In this case, there can be positive and predictable negative effects. Even though, it also depends on the variability of humanity in general, which is the need of one person in the universe.
5. Well…. in my opinions positive effects included:

-Communication and are easy to carry.

-Mobile phones also can be termed as a portable computer as there are lots of activities which can be done on a mobile phone.

-It helps us in making our lives easy and convenient.

-Mobile phones are very important because they make an individual's life more convenient and are the perfect way to stay connected with everyone…. etc.

6. After that about the negative effects included:

   -Many road accidents occur due to mobile phones' use during driving.

   -The interact with the phone with their eyes used to, and addiction have increased mental health diseases like anxiety, depression, and other mental disorders.

   -lack focus in doing stuff.

   -uncommunicative to peoples.

   -It has taken our lives.

   -The screen brightness of your gadget (Mobile phones) at higher than 50%, you still may not risk a permanent damage but many short-term problems, such as digital eye strain, eye irritation and dry and fuzzy eyes.

   -Dark mode may work to decrease eye strain and dry eye for some people who spend a lot of time staring at screens.

   -Security issues and cyberbullying are famous issues that are faced by mobile phone users.

7. Yes, I believe it also has big impact on user's health.
8. Metal illness and possible eyes problems.

Answer 3: SOKBUNTHY VAI

1. Surely, I believe this would happen in the future because I believe there is so many benefits from it and I see no disadvantage.
2. I hope to see this kind of technology in 2026 put in use for every user, especially for people for suffer from disability and cannot use smart phone.
3. Yes, I believe.
4. Yes, this is possible for sure.
5. The advantage is people can have a very cool feature and need to use only with their eyes when needed. We can also make us more convenience using smart devices such as smart TV etc.
6. Require high learning ability for the user.
7. Yes.
8. It would affect your health, such as cause headache because of too much staring.

B. USE CASE AND HCI SCENCARIOS

Scenarios 1:

Home Screen: In this demo, a user looks at the calendar icon on their home screen (A) and pulls the phone closer (B) to open it (C). The calendar is minimized with a push action (D). The user then fixates on the weather icon and pulls the phone closer (E) to open the app (F).

Scenarios 2:

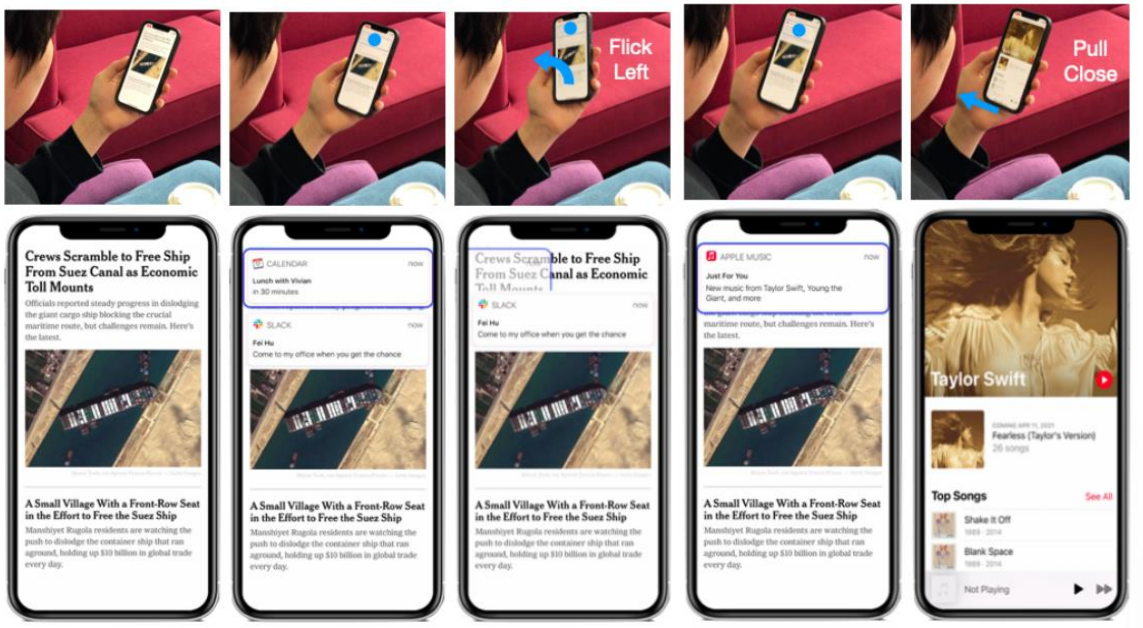

Fig.A **Fig.B** **Fig.C** **Fig.D** **Fig.E**

When two alerts arrive, a user is reading the news (A) (B). They read the first one and then swipe left to dismiss it (C). The user then reads the other notice and swipes right to snooze it (D). A third notice appears as the user takes a drink of their coffee (E). The user draws their phone closer (G) to activate the app after reading it and wanting to see more (F). The User associated application the user has never had to touch the screen at any point.

C. FUNCTIONAL REQUIREMENETS:

The idea is to provide a clear and detailed description of what your system is supposed to do:

FULLY IMPLEMENTED or THE PREVIOUS STEP OF ORIGINAL PROJECT:

The technology is based on a computer that can detect eye movement from a camera. When you stare at the screen, the senser detects your eyes and acts like the cursor on the computer screen. When you shift your eyes from the top to the bottom of the screen, the camera detects them and moves accordingly. Only eye detection is possible with this program. Still, the user is unable to engage with anything with their eyes.

NOT FULLY IMPLEMENTED or ORIGNAL PROJECT:

The system is based solely on mobile devices and computers. Because it is not a completely completed function for the totally eyes interaction, the system still includes eye and hand interaction. Hand interaction that exists on the application is as follow; Flick Forward, Flick Left, Flick Right, Page Left, Page Right, Pull Close, Push away. When a notification occurs, we just look at it; the phone identifies it instantaneously through the camera, and all it takes to remove the notification is a simple rotation of the phone. Furthermore, if we need to enlarge the image or notification, we may do it by just pulling the phone closer. This implementation is used not only by notifications, but also by other applications such as a gallery, music player, social networking platform, email, news reading platform, and so on. We can now use the phone more quickly as a result of this. The following are some useful features.

POSSIBLY CONTINUATION or THE ENHANCED ONE:

For the purpose of improvement, we will create a technology that eliminates the need for hand-based interaction and allows users to operate devices only with their eyes, which will act as the mouse cursor on the screen and allow for typical phone functionality. The system is based on mobile devices, computers, smart TVs, and other smart gadgets. The devices fully employ the eyes interaction, particularly for computers and smart televisions, which have a battery connector with sockets when in use to avoid battery drain issues. The future of this application is for people to use with only their eyes while using smart devices, such as when it is not necessary to use their fingers. For example, if

you need to turn off your television while sitting on the couch and the remote control is too far away for your hand to reach, you can use this eyes interaction to close the devices.

3. CONCLUSION

As a result, we now have a better understanding of the use case and every piece of functionality in the program, including those that have been developed and those that have not.

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