**Overview**

**Topic**

Our project is to create a pair of lens which can project holographic to the real world. The lens will be small enough for us to carry around every day. The project aims at productivity and gaming possibilities. Demonstration with holographic will be fantastic and gaming in the real world will be a real fun.

If the project is successful, we aim at taking place of VR helmets for the future. Design companies would benefit the most from our project using the real-time holographic demonstration. Productivity will be pushed beyond the limit after the main part of the project is completed.

**Motivation**

The main motivation of our project is movies about future technologies and the current problems we have. Holographic technology is important because it takes possibilities to a new level. Lots of new products relating to virtual reality is coming out these days. They all focus on creating that ‘real’ experience which went the wrong way. Holographic will merge that ‘virtual’ together with the real world, making us focus on the real thing. If I was able to work on this project, I would show him the concept of holographic and how it can change our lives. I would show him the holographic projected and demonstrate how it merges with the real world.

**Landscape**

Similar products are VR helmets. They are widely available these days. They are main competitors for our project as well. The main difference between our project and VR helmets is the core technology. Instead of letting the viewer to drown into the image shown on a screen, our project aims at projecting holographic object images to the real world. With a VR helmet you will not be able to see the real world but with our project, we are using it with the real world.

**Detailed Description**

**Aims**

The aim of our project is to implement holographic technology onto a normal sized pair of glasses. We need to prepare a lot of things before we can do this.

First, we need to develop a software which is as efficient as possible. This is to make sure that we need minimal hardware power to push the whole device. Many manufactures often ignore the importance of software. In fact, it is very important for a device to run smoothly and efficiently. User experience is also most affected by software. By developing a great software, we won’t have to face the problem of trying to put high performance chips into our small-sized lens.

Next, we need to come up with energy efficient and small-sized chips in order to fit into a pair of normal sized glasses. Performance is important since we have to project complex holographic objects, but we also need to consider the heat generation and battery consumption. Creating a chip that has best performance to energy ratio is a significant part of our project.

Battery is also a huge concern for us since we have to make sure that the device is able to last at least one day for best user experience. We might consider using new technology instead of the popular Li-iron batteries to provide small size and huge capacity.

After all these small goals are achieved, we will be able to carry out the first sample of our project.

**Plans and Progress**

Our project is a pair of lens with the ability to project holographic objects. This project idea actually came from a bunch of movies taking about future. At the beginning, me and Bowen talked about what we can potentially do. We are all interested in gaming and cool technologies, so this idea became our goal.

At first, we are not sure if we are doing VR or some other technologies since it is not that easy to distinguish between them. We focused on VR at the very beginning. Later, considering that VR technology is already there, and VR helmets are affordable and practical these days, we decided to try something new. Holographic went into our eyes at this point. We finally decided on holographic because it is a technology that has came out earlier but not fully developed. I have seen Michael Jackson being brought back to life using holographic technology. I have to say that it was so real that nobody could believe their eyes. With this technology we can bring a lot of other things to life, making new possibilities and extend the boundaries.

Then we discussed how are we going to implement this technology to something we can use every day. We first considered using the same form as VR helmets, making something that stays on a person’s head to project the object. Later we thought that a helmet would be too bulky to carry everyday (and it won’t be comfortable to wear all day too). We did some research afterwards and our eyes laid down on Google Glasses. Yes, a small form factor projector would be nice to carry around all day. So, we confirmed that we will be making a pair of glasses to put the holographic projector on.

Since our project is a product that is not possible without future technology revolutions to provide proper hardware for us to use, we cannot do much at this stage. We can only do preparations to equip ourselves to be ready at any time. We made our plans to draw out the prototype of our project. Me and Bowen did some research on the technology and listed out the hardware we need. At this stage, our project is limited to a simple mock up since we are still not that skilled to do any further. Most of the part of the project will be completed in the future.

For our project, we need a designer, a hardware expert and a software engineer. To acquire all the knowledge we need, we need to focus on different directions as individuals during university studies. I believe that after three years of study, we will be well equipped to be ready to do something huge. And I assume that new technologies will come out these years to provide us with efficient chips and batteries. No matter how well the technology evolves, we always have to make sure that we have an efficient enough software to use for our project. This is to minimize the hardware requirement and reduce possible tackles during the design.

The following detail is how we have decided on our project so far:

It will be in a form of a pair of glasses at this stage. In the future, we plan to make it as small as a clip and users will be able to clip it to wherever they want.

It has a battery life of 16 hours under intense usage.

I can project holographic to any possible area it can reach.

The content projected is sharable and users can decide whether the content is public or private.

We plan to make different versions to accommodate to different needs since the ‘PRO’ version will definitely cost a lot which might make it impossible for normal users to afford.

We will work with game studios to include some interesting holographic game at launch.

We will try to make partnership with Intel because they are the leader in producing power efficient chips. Will might try to get an exclusive version of chip for us if possible.

The glasses will run on its own system designed by us and will be compatible with most of the popular platforms on the market (Windows, Mac, Linux, IOS, Android etc.).

The glasses will be paired using the latest Bluetooth technology and Wi-Fi if accessible.

The plan will likely to be changed since technology is evolving rapidly. We will keep on this track at the moment and try to deliver it.

**Roles**

For our project, we need the following roles:

Lead Developer: Person who takes charge of management and supervising. This person is important because he determines how smoothly the project will run and how easy it will be for us to overcome possible obstacles.

Designer: Person who is competent in engineer design and precise operations. He has to be rich in hardware knowledge to make sure that the design does not face a lot of technical issues. The designer will affect what type of chip, battery and potential material we will use for the project.

Software Engineer: Person who develops the operating software for our project. The software need to be efficient so that the hardware requirement can be minimized.

Hardware Expert: Person to help encounter possible hardware obstacles. To come up with new hardware design and optimal passive cooling solution for the chip.

**Scope and Limits**

Considering the whole project, the most difficult part for us to encounter is the hardware part. Today’s technology is not enough to produce such tiny but powerful chip for us to put on the lens. What we decided to do is to make a larger version of the holographic lens. In this way we will be able to use available chips on the market to at least finish the software part and determine how it actually operates.

As for the hardware part, we might not include it in our project since there are large companies that make new chips with updated technologies every year. We don’t have to start our own hardware business like that.

**Tools and Technologies**

Java JDE 10

Autodesk AutoCAD

Holographic Technology

Intel chips with GPU on board

**Testing**

I will test my project base on user experience. I will choose different type of users (designers, office workers, general home users, gamers) and approximately 50 each. This is to find out which type of user benefit most from our project and what can we possibly improve in our design. The goal is to make sure that our project will make life easier and fun. So, it’s very important to study based on user’s feeling. Our project will be successful when users are able to easily accommodate to the design and concept.

**Time frame**

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| Week 1 | Decide on specific parts of the project, Discussion |
| Week 2 | Work on the detailed design concept and draw the draft for the design |
| Week 3 | List out the materials and technologies we need and allocate the roles |
| Week 4 | Designer: Focus on the internal design for the project  Hardware: Assist on the designer in terms of choosing the proper hardware  Software: Find out what users need and what detailed functions we need |
| Week 5 | Designer: Draw the internal design  Hardware: Study on available hardware to select the optimal  Software: Find out whether the functions required are practical and how can we apply on the project. |
| Week 6 | Designer: Draw the internal design  Hardware: Study on available hardware to select the optimal  Software: Separate different sections of the software and start working on them |
| Week 7 | Designer: Draw the external design  Hardware: Test the selected hardware to see how well they work together  Software: Come up with the software UI design first draft |
| Week 8 | Designer: Refine the external design  Hardware: Further testing and changing the hardware  Software: Start coding on the software for a simplified version |
| Week 9 | Designer: Finish the first draft of the complete design  Hardware: Work with designer to implement all the hardware designs  Software: Finish the first draft and do some basic testing on the software |
| Week 10 | Together: Build up a first draft of the project and test compatibility |
| Week 11 | Together: Tweaking and testing to make sure everything works smoothly |
| Week 12 | Select the targeted users to test our first sample of the project |
| Week 13 | Collect and analyze the obtained user data to see potential issues |
| Week 14 | Tweaking and testing to fix small issues discovered during testing |
| Week 15 | Work on the final report for the project |
| Week 16 | Final report for the project and release what we have accomplished |

**Risks**

On the software part, we are still beginners. So, we are not sure what Java can do at the end. We decide to use Java to start our project because it is most widely used in the world. There might be problems when we meet some software issue where Java cannot accomplish. We will then have to learn something new.

On the hardware part, the main risk is that we do not know when the technology will evolve to the point where we can find proper chips and batteries we need. Our project cannot be produced without the support of proper hardware, so we will have to wait and see.

**Group processes and communications**

Communication is definitely an important part of a project. We decide to meet up face-to-face twice a week. Our main way to communicate is through WeChat, a Chinese communication platform that is widely used around the world. Project updates will be made through GitHub and Google Drive. Having group members not responding to communications is hard to deal with. I would keep trying to get in contact twice a day. If he/she still not respond to it, I might consider kicking him/her out of the project. A person like this will definitely slow down the project process as we do not know whether the work allocated will be done properly.