# THE POSSIBILITY OF CREATING A HIGH-FIDELITY VIRTUAL

# REALITY EXPERIENCE

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# THE POSSIBILITY OF CREATING A HIGH-FIDELITY

# VIRTUAL REALITY EXPERIENCE


I have completed my paper on the possibility of creating a high-fidelity virtual reality experience.

This report mentions all completed discussed and research in this topic. I have concerned about several problems, such as the reason why it is possible to create a virtual-reality experience and the technology which are needed by high-fidelity virtual reality experience. These questions have led me to do some researches and finally finish this paper.

Thank you for the opportunity to complete this project. I am looking forward for your guidance.


Sincerely,
Huidi Zhang

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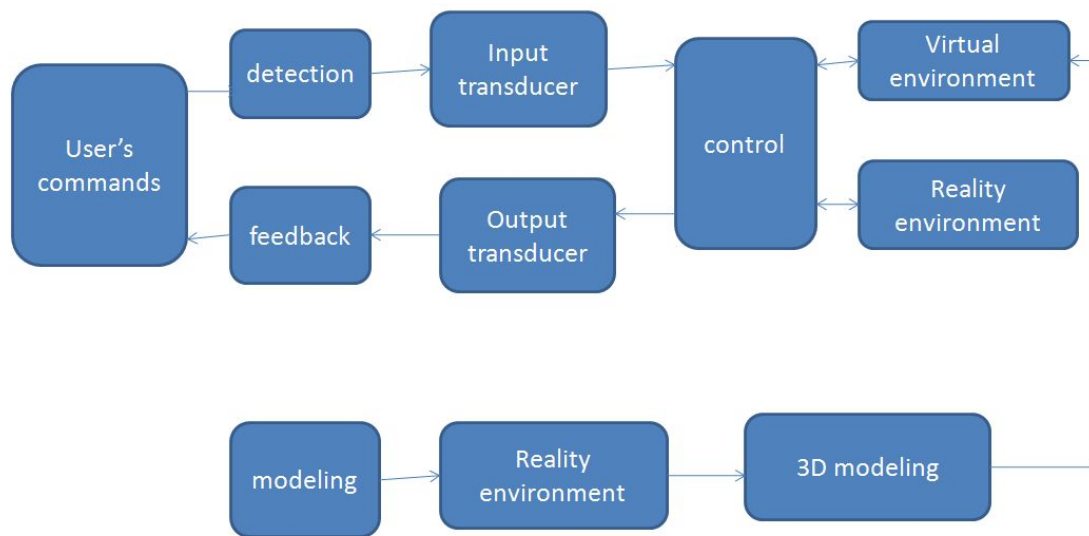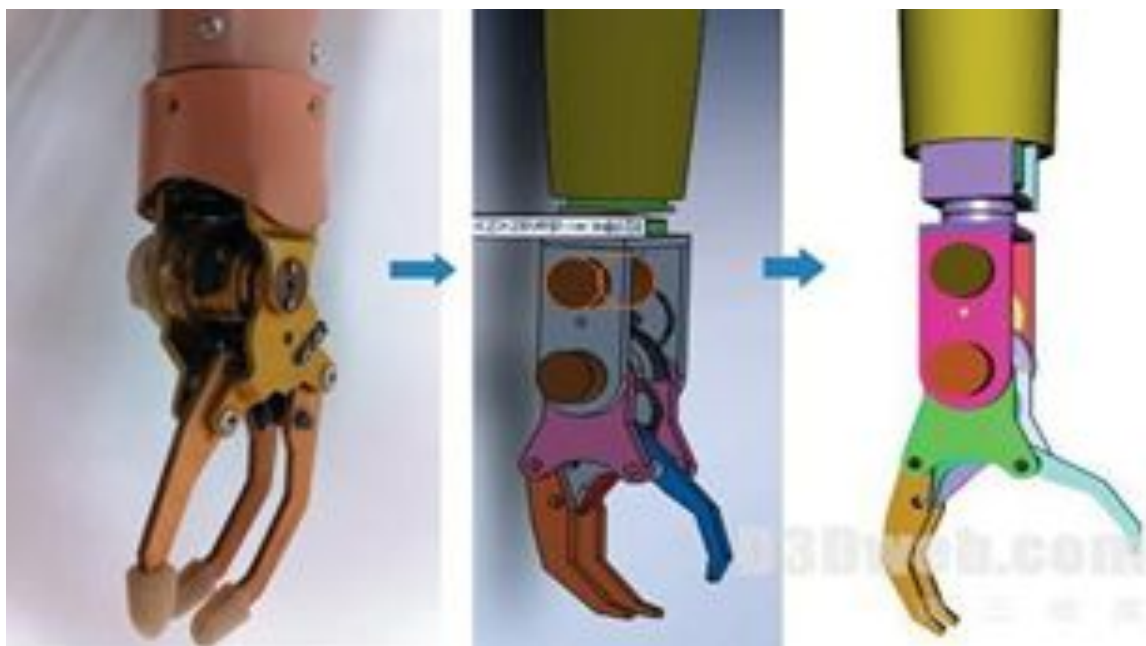Figure 1.The components of a normal virtual reality system



Figure 2.The artificial limb in virtual reality area.

# EXECUTIVE SUMMARY

Virtual reality has emerged as an effective technology with a variety of potential benefits for many aspects. This paper focuses on the development of virtual reality and provides some necessary discussions about the possibility of creating a high-fidelity virtual reality experience. Based on a brief introduction to virtual reality technology, this paper provides some difficulties to create a high-fidelity virtual reality experience. Then, by analyzing the limitations of virtual reality technology, this paper gives three important reasons which make it possibility to creating a high-fidelity virtual reality experience in the future. Finally, this paper draws to the conclusion that it is possible to create a high-fidelity virtual reality experience and provides some applications of high-fidelity virtual reality system.

# INTRODUCTION

Virtual reality, a very powerful and compelling computer application, has attracted a lot of interest of people in last few years. Through virtual reality technology, humans can interface and interact with environments which are created by computers. Therefore, it is critical to make a thorough discussion of virtual reality and its future development. This paper discusses the possibility of implementing a high-fidelity virtual reality experience. It is divided into four parts. The first part briefly introduces the concept and the development status of virtual reality. Virtual reality technology enables people to be immersed in a supernatural experience, which is simulated by computers. Generally, the virtual reality experience has more than two dimensions. Then, the second part of this paper gives the reasons why it is possible to produce a high-fidelity virtual reality experience from three aspects, involving the development of force feedback, communication bandwidth and image resolution. Through careful analysis, this paper draws to the conclusion that it is possibility to creating a high-fidelity virtual reality experience in the future. Finally, the last part gives applications of high-fidelity virtual reality system.

# DISCUSSION SECTIONS

### I. Virtual Reality And Its Development Status

Virtual reality is a technology which allows people to make exploration and interact with an immersive environment. [1] In the last few years, virtual reality has drawn much attention. Many scientific communities and individuals have been working in the field of virtual reality for a long time, having recognized it a valuable human-computer interface. Virtual reality has caught the imagination of the common people through a great deal of books, movies, televisions and so on. In a virtual reality system, users can experience computer-generated world physically, which enables them to experience some realistic situations. [2]

Currently, the difficulties of creating a high-fidelity virtual reality system are apparent. It is the technical about force feedback, image resolution ratio and the bandwidth of communication that restrict the further progress of virtual reality technology. However, its universality and importance may give impetus to conquer following limitations. The detailed reasons will be illuminated later on in three aspects.

## II. MAIN REASONS

### A. Reason 1: Development Of Force Feedback

Firstly, the rapid development of force feedback provides the guaranty for high-fidelity virtual reality systems. Nowadays, some devices with more than two models such as wired glove can be used to make a good experience. By connecting these devices, every action in the virtual reality systems will have an opposite reaction at the same time. Therefore, the immersive interact makes virtual reality system more fidelity. At this level, creating a high-fidelity virtual reality is possible.

### B. Reason 2: Development Of Communication Bandwidth

Secondly, the high speed progress of communication bandwidth increase the possibility of creating a high-fidelity virtual reality experience. In order to provide subscriber with a favorable imitative environment, a number of scientists have researched the expansion of the communication bandwidth for the virtual reality system.[3] Some new generation wireless communications also offer enough communication bandwidth for virtual reality systems. Currently, the on-going fast development of these technologies makes high-fidelity virtual reality experience easier to be created. The probability of breaking current technology limitation is high to a certain degree.

### C. Reason 3: Development Of Image Resolution

Finally, the implementability of high image resolution is a powerful guarantee for the high-fidelity virtual reality experience. An important goal of virtual reality is to present a supernatural scene with computers. To achieve this, the high resolution of images should be high, which means that the individual pixels cannot be distinguished. Nowadays, the advent of Virtual Portal makes it possible to obtain a virtual reality system with low-distortion and high image resolution. [4]All these will not only increase the fidelity but improve user experience as well. As the success of image resolution is the key factor to create a virtual reality system, it is possible to produce a high-fidelity virtual reality experience system in the near future.

### III. APPLICATION OF VIRTUAL REALITY

Virtual reality technology is changing the traditional digit scenic site from two-dimensional to multidimensional, which enable users to feel that they are in the real life. Therefore, virtual reality systems have applications in many areas, such as digital tourism. With the development of technology, high-fidelity virtual reality has been a mature technology in some fields. For example, a science team has developed a high-fidelity virtual reality medical equipment which can give disabled people a artificial limb. Also, in order to improve endoscopy teaching quality, some professors create virtual reality computer imitators.[5]

# CONCLUSIONS

In conclusion, high-fidelity virtual reality technology is a useful tool in a wide range of areas. In architecture, engineering, education, medicine and many other fields, virtual reality provides a powerful tool which allows users to experience situations that could hardly be created in the real world, which means the high-fidelity virtual reality is important for our future life. With the recent advance of technology in the area of force feedback, communication bandwidth and image resolution, the revolution of high-fidelity virtual reality will be within sight. Through hard working of researchers, it is possible to conquer current technical boundedness and to establish a high-fidelity virtual reality system. The future of high-fidelity virtual reality technique will be bright.