

Exploration and Practice of Virtual Simulation Laboratory Construction of Environmental Art Based on Computer Aid

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Abstract. In the innovation and development of modern college education, the construction of virtual simulation laboratory for environmental art majors by using computer-aided technology can not only solve the problems existing in traditional experimental teaching, but also improve the comprehensive quality of students' management ability, practical ability, communication and coordination. In order to ensure the education and information technology can depth fusion, puts forward the relevant national education department for the construction of the virtual simulation experiment teaching center, asked around colleges in positive response at the same time, strictly abide by the bricks, fill with virtual reality, can not the basic principles of virtual reality, virtual simulation experiment teaching center of construction to promote. Therefore, this article in the understanding of virtual simulation lab construction and management status quo, on the basis of deep study the computer aided art as the core of environment simulation laboratory construction content and application functionality, clear the current environment art class teaching with virtual simulation laboratory management measures, to ensure well practice teaching activities.

Key words: Computer aided; Environmental art; Virtual simulation; laboratory

1. Introduction

In the development of modern economic and technology reform, education and information technology of our country universities in deep integration, put forward the construction of virtual simulation laboratory. In order to continuously strengthen the construction and application of high-quality experimental teaching resources in higher education, the Chinese education department put forward the Notice on the Construction of Demonstration Virtual Simulation Experimental Teaching Projects in 2017 and 2020 in 2017, which should take modern information technology as the main basis. Reform and innovation should be carried out on the experimental projects with serious environmental pollution, more dangerous factors, higher costs and greater difficulty, so that teachers and students in colleges and universities can master the knowledge and practical skills faster, and improve the quality of experimental teaching in colleges and universities. In the development of information technology innovation, the majority of colleges and universities in the building of the virtual simulation laboratory of management, pay more attention to software and hardware configuration, project development and related professionals equipped with defects, and will give preference to the secondary sector collaborative management style, this leads to employees in a professional life is the number of actual workloads, management application on the surface only, It is difficult for colleges and universities to achieve the goal of virtual simulation construction.[1.2]

In the rapid development of advanced technology such as computer and Internet, virtual simulation experiment has changed the construction mode of traditional experimental system, broken through the time and space limitation of experimental operation, and improved the application performance of the overall experimental equipment. It is the third scientific research method after century theoretical research and experimental research. From the Angle of environment art of teaching, virtual simulation experiments is to point to in a computer system, using the virtual reality technology to achieve a variety of virtual experiment environment, teachers and students can be like in the real environment, in order to complete a variety of predetermined experimental project, eventually achieve the learning effect of equivalent to or even better than the effect it has in the real environment. According to the analysis of the virtual simulation laboratory

built and applied in colleges and universities in recent years, it is an interactive environment composed of simulation programs, experimental units, tools and reference materials on which experiments depend. Laboratory users can expand the laboratory by adding new objects and building new experiments and converting them into hypertext software.[3.4]

Combined with the structural diagram of virtual simulation laboratory shown in Figure 1 below, it can be seen that the application in environmental art teaching in colleges and universities has the following advantages: first, it helps to provide a good experimental platform and improve the level of experimental teaching. In the traditional teaching work, theoretical knowledge and experimental teaching are separated, there is no too much experimental content in the theoretical course, but now teachers can use virtual simulation laboratory to introduce theoretical knowledge. Secondly, it is helpful to integrate experimental teaching resources and build an open and transparent laboratory environment. Virtual simulation laboratory is easier to build and implement, convenient remote online detection and remote measurement and control, can use network technology and existing equipment to build a powerful experimental system, so as to reduce the purchase cost of technical equipment; Third, it is helpful to change the experimental teaching mode and actively train innovative talents in science and technology. Virtual simulation experiment can allow students to enter virtual scenes and independently complete experimental operations according to experimental requirements, which can not only train students' independent thinking and design ability, but also deeply mobilize students' interest in learning, and actively cultivate excellent talents with practical ability and innovative spirit.[5]

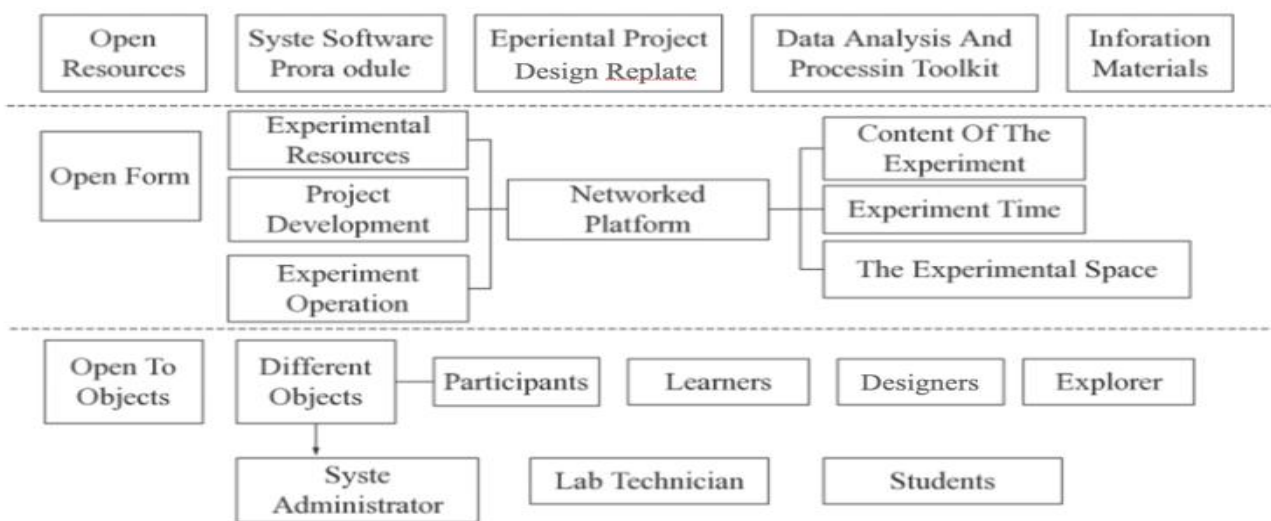


Fig. 1 Structure diagram of virtual simulation laboratory

Understanding in recent years, environmental art class teaching, as an interdisciplinary comprehensive professional, including psychology, material science and other fields, human body engineering, building gardens, so wide talent training goal requires professional theory, professional skills, creative innovation consciousness, and the reference virtual simulation laboratory not only conforms to the professional development needs, and can satisfy the requirement of talent cultivation. Therefore, this paper mainly studies the construction content and effective countermeasures of virtual simulation laboratory of environmental art with computer aided as the core.[6.7]

2. Method

2.1 Construction Objectives

Based on the experimental courses of environmental art in colleges and universities, a virtual simulation experiment platform for training practical ability of technical talents is constructed, a

normative and open operation management system is proposed, and an online sharing system with integrated development of multiple functions is finally obtained.

2.2 System Design

Based on the analysis of the system architecture diagram shown in Figure 2 below, it can be seen that the virtual simulation laboratory of environmental art should establish its own portal website to realize multiple functions such as information release and experiment appointment. During the period of education management, the main function of the laboratory will be realized by building a virtual simulation experimental teaching platform. Whole platform will rich material library, science, engineering, process simulation software as a fundamental basis, such as using multimedia technology in computer environment, build a virtual laboratory for colleges and universities can operate on virtual experiment equipment, let the teachers and students in Internet use close to the real human-computer interaction interface simulation experiments.

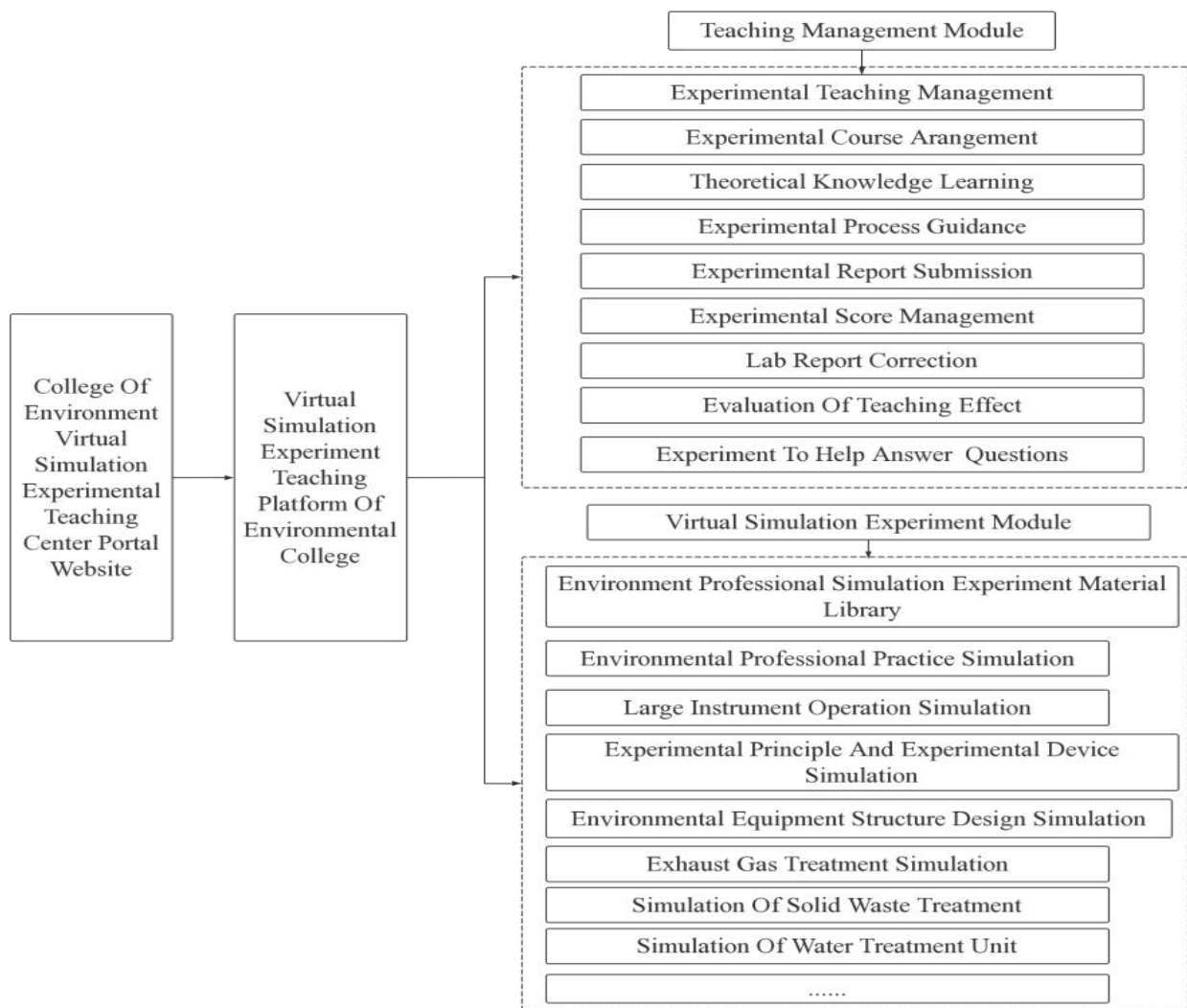


Fig. 2 System architecture diagram

Using virtual simulation experiment teaching platform, the realization of the function of the teaching management module, help environmental art teachers for the basic experiment teaching management, the structures, typical experimental environment or obtaining experimental cases, on the basis of present related directly to the students experimental tasks, finally check the experimental results of the student, get the virtual simulation experiment teaching of the final grade. At the same time, students can also choose courses and study in the teaching platform, and submit the experiment report directly after completing the experimental training.[7.8]

The construction of virtual simulation laboratory of environmental art should focus on the teaching needs of environmental art, simulate the equipment and instruments required by real experiments, provide experimental environment similar to real experiments, and set open experimental management functions. Among them, students can conduct multiple training in the virtual simulation laboratory according to the content they are interested in or the experimental skills they have not mastered in class. The overall platform construction can not only facilitate students to carry out humanistic teaching management, but also implement three-dimensional talent training mode, truly meet the training needs of different types of students, and create a high-quality teaching environment.

3. System Functions

First, portal websites. In order to better present the information resources of virtual simulation laboratory of environmental art and provide high-quality teaching services for teachers and students in colleges and universities, it is necessary to build a standardized and safe portal website. By analyzing the flow chart of the virtual simulation laboratory as shown in Figure 3 below, we can see that the overall portal contains the following contents: First, it introduces the specific situation of the laboratory, including available resources, laboratory composition, staff, latest announcements, etc.; Secondly, laboratory appointment management. College teachers and students should reserve the operation time and application equipment of the virtual simulation laboratory according to the teaching and research needs of environmental art, so as to facilitate the internal management of the laboratory to prepare in advance, and related users can check the use of the laboratory online. Finally, wechat public platform. By integrating the laboratory portal into the wechat public platform, users can use the wechat public account to query the service information related to the virtual simulation laboratory, and can also view the recent experiment arrangement related to themselves through wechat.[9.10]

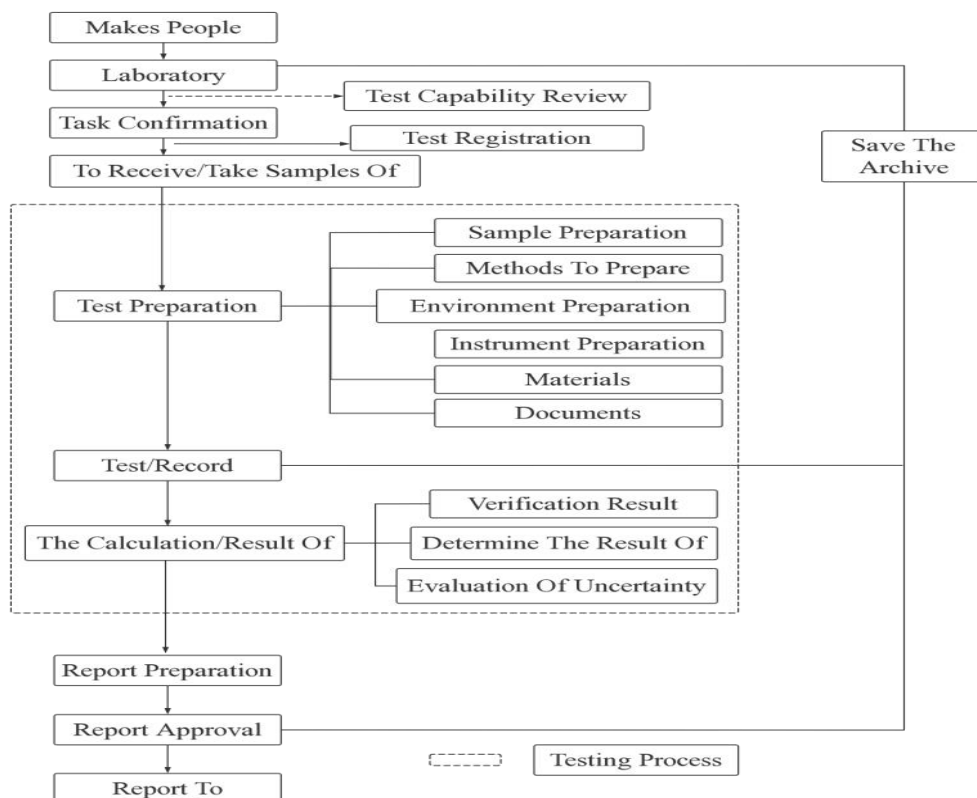


Fig. 3 Flow chart of virtual simulation laboratory

Second, teaching management. In the virtual simulation experiment teaching of environmental art, the laboratory should provide teaching management functions to administrators, teachers and students. Generally speaking, the virtual simulation experiment platform integrated with the unified authentication system of colleges and universities can realize the single sign-on of the campus website and improve the efficiency of users. At the same time, the integration of the virtual simulation experiment platform and the school educational administration system can ensure that the educational administration information can be updated in real time. College teachers and students can be released through course site resources, experimental solutions, interactive online teaching activities, students can be experimental experience, knowledge, problems such as content distribution in the course site, and the teacher wants to after the experiment found that less than as soon as possible, and students to discuss, in order to obtain the experimental teaching feedback, scientific adjustment of the experimental teaching progress and depth.

Third, the experiment module. Based on the structural diagram of the virtual simulation laboratory shown in Figure 4 below, it can be seen that it needs to provide experimental materials and techniques related to environmental art for teachers and students in colleges and universities. The commonly used simulation software of this platform involves the following points: First, the library of simulation experiment materials for environmental majors. Using electronic chart is given priority to with flash and 3 d, environmental protection facilities and of various components of internal structure, working principle, working process and so on to show vivid out, can not only convenient and professional teachers teaching guidance, can let the students to quickly understand environmental art work principle and work process, provide effective basis for practice teaching; Secondly, the experimental simulation system. This system is composed of several functional modules, such as experimental guidance, experimental operation, parameter setting and data processing. It needs to be set in combination with the knowledge of environmental art courses. The common contents include many systematic experiments, such as wastewater treatment, organic gas and heavy metal determination. Finally, the practice simulation system. Environmental art is a highly technical and practical professional teaching, students in the virtual simulation laboratory, according to the knowledge and skills of practice training.

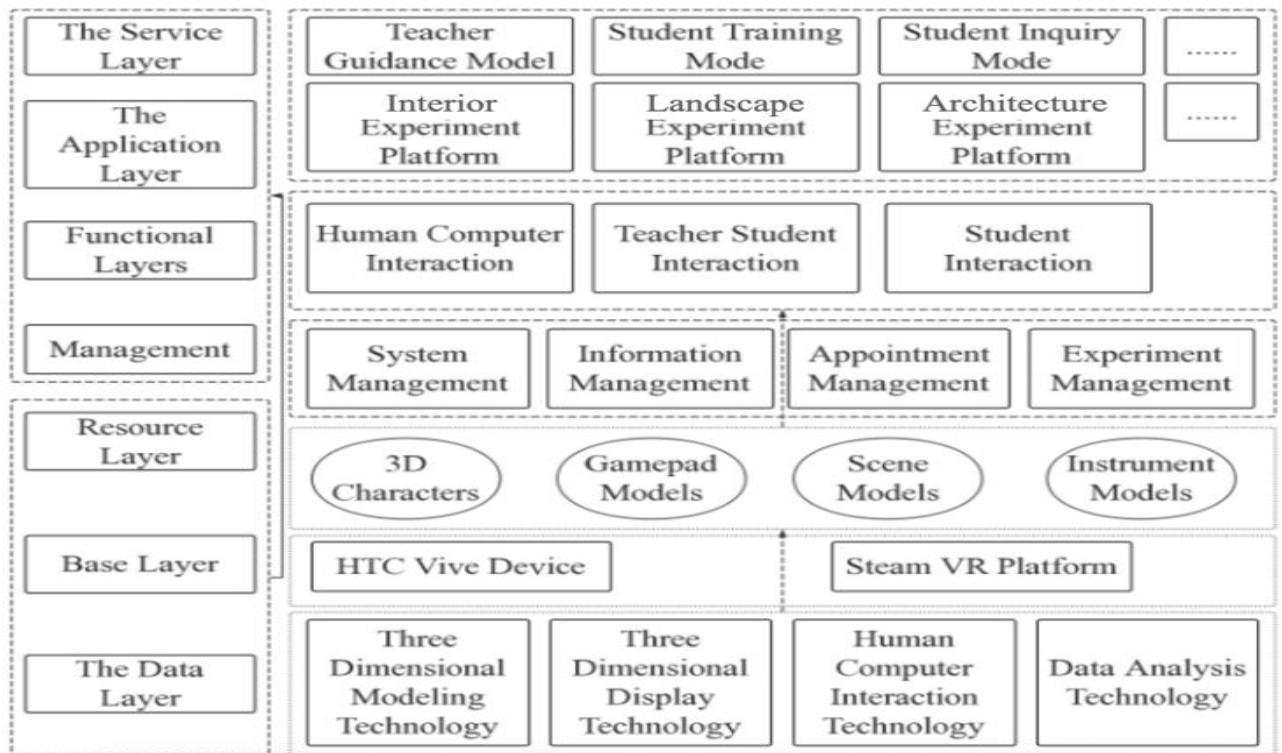


Fig. 4 Functional structure diagram of virtual simulation laboratory

4. Result Analysis

From the accumulated teaching experience of environmental art majors in recent years, the construction of virtual simulation laboratory based on computer-aided technology should not only get rid of the restrictions of traditional teaching ideas, but also optimize the training objectives of professional talents, and truly realize the application value of virtual simulation laboratory in teaching management. On the one hand, create a shared education system based on multiple laboratories. Combined with the analysis of the shared platform shown in Figure 5 below, it can be seen that the main purpose is to facilitate the information transmission and education management of the laboratory, break the development situation of the separation of traditional schools and departments, and cultivate more excellent talents in collaborative teaching management. On the other hand, while establishing a good cooperative relationship with enterprises, colleges and universities should use virtual simulation laboratories to set up research teams to jointly discuss research topics of environmental art, so as to truly realize the joint construction and development of laboratories and enterprises.

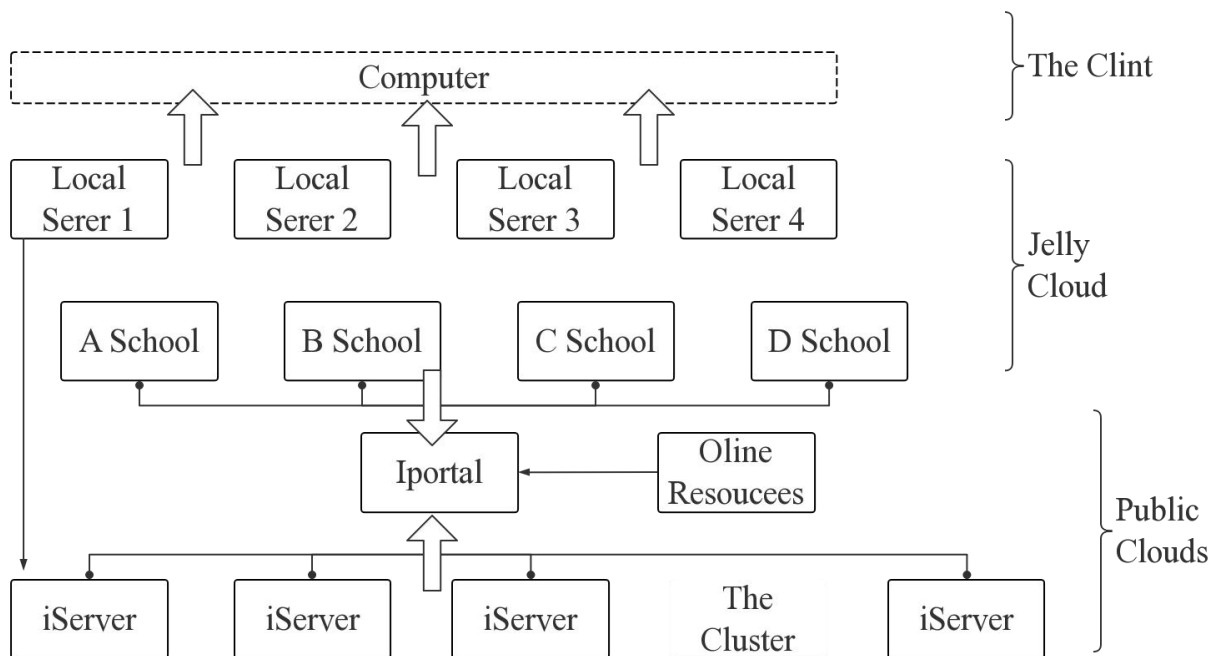


Fig. 5 Structure diagram of shared platform

5. Conclusion

To sum up, as an important site for environmental art education and scientific research in colleges and universities, the laboratory can gradually improve the construction and management level of virtual simulation laboratory and optimize the training quality of professional talents by combining computer-aided technology theory for optimization and innovation under the background of modern education innovation. Therefore, Chinese universities should attach importance to the construction and management of virtual simulation laboratory, strengthen the training of professional and technical personnel, fully mobilize the resources inside and outside the university, and actively explore the development of virtual simulation laboratory in the new era.

Acknowledgment

First of all, I would like to thank my parents and my grandmother. they are always there supporting me without any requirement in return. That's why I was able to have the opportunity to

continue my studies and further my education. I thank my loving family and family is where I can forever turn.

I would like to give my heartfelt thanks to my academic supervisor Prof. Zhi Yu, his broad knowledge made me realize the fun and eye-opening nature of academic research. My other mentor Prof. Peng Rong, has opened my eyes to a different world and a different way of looking at it.

Finally, my cordial thanks also go to my family member and friends who love and care me and whom I love and care.

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