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Feasibility Analysis Report

Version 1.0

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Revision History

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**Key Word**

Chinese chess, 3D game, multi-player

**Abstract**

The project is about Chinese chess game. Five modules are included: Basic logic module, Artificial intelligence module, Network connection module, Game mode module, and 3D effect module.

This document is to measure the feasibility of this proposed framework.

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# Introduction

## Propose

The project aims at designing a multi-player 3D Chinese chess game. In order to develop a game with high immersion characteristic, a lot more works are evolved in addition to the basic logic part, for example, flexible game modes, user-friendly game scene, and interaction with other players.

## Background

Game Name: Chinese Chess  
Task presenter: Shi Yu, Lu Hao, Wan Chengcheng, Cao Yifeng  
Developer: Shi Yu, Lu Hao, Wan Chengcheng, Cao Yifeng

## Definition

AI: Artificial intelligence

## Reference

Unity3D official documents

# Presupposition

## Requirement

1. Functional requirements

With networks, the 3D Chinese chess game supports both man-machine and man-man mode. Multiple game modes are also available.

1. Non-functional requirements

It should be robust, user-friendly, portable and extensible.

1. Inputs

User operations and network communication information.

1. Outputs

3D game scenes and network communication information.

1. Workflow

Refer to 4.2 in detail.

1. Deadline

The whole system should be completed on December.

## Objective

Provide chess game with high immersion characteristic.

## Condition, Supposition and Limitation

1. Minimum life time of system: 3 years
2. Time to select suitable solution: 1 week
3. Conditions of developing/run-time environment in hardware and software

Hardware:

1. Personal computer.
2. Minimum runtime memory requirements: 128M
3. Hard disk space for installation: 50M.

Software:

Mac OS X, Windows 7/8

## Feasibility Analyzing Method

1. Potential user survey
2. Experts consultation
3. Market survey of similar or relevant products

## Evaluation Criteria

The criteria of evaluating the system are: functions supported or provided by the system, time cost to develop the system, and the usability of the system.

# Existing System Analysis

Chinese chess is a classic game. However, most of them only simulate real world scenes and have little innovation.

## Workflow and Dataflow

## Working Load

People have to buy new HDR display devices to show HDR images.

## Expenditure

HDR display devices are less accessible than ordinary display.

## Personnel

N.A.

## Devices

Special HDR display devices.

## Limitation

Though HDR display devices can replace ordinary devices, there is a long way to widespread HDR display.

# Proposed System

## Introduction to the Proposed System

Existing binocular display systems only utilize this additional image domain for stereopsis. Our human vision is not only able to fuse two displaced images, but also two images with difference in detail, contrast and luminance, up to a certain limit. Utilizing this proposed system, which is based on the binocular single vision study, two LDR images are synthesized; then the two images “fuse” in our eyes perfectly.

## Workflow and Dataflow

Input an HDR image  
  
Tone-Mapping  
  
VDP & BVCP  
  
Output LDR image pair  
  
Show on binocular display

## Improvement

Unlike binocular display, high-dynamic range (HDR) display is less accessible to the general public. The proposed system make use of existing binocular display, which is used for 3D movies. This approach is more affordable.

## Impact

### Impacts to the Devices

Just a binocular display device.

### Impacts to the Software

Refer to 2.3.

### Impacts to the User

Need no longer a special HDR display device but an ordinary, low-cost dual display.

### Impacts to the Run-time Process

If binocular viewing comfort occurs, user can send a report to developer to describe and the developer try to solve it.

### Impacts to the Development

Not only LDR images are synthesized, but also viewing discomfort be avoided.

### Impacts to the Location and Equipment

Our product’s user only needs a binocular displayer to display HDRI.

### Impacts to the Expenditure

The user who buy this software do not need much to deploy and run it.

## Limitation

This software can’t run on ordinary displayers such as LCD.

# Alternative Solution

For the time being, there is no alternative solution.

# Cost/Benefit Analysis

## Cost

### Cost for Infrastructure

a) Hardware Devices: 1 or more Personal Computers

Storage (Array Disk, Compact Disk)

b) Software: Windows XP/2003 Server/NT4.0 by Microsoft

Rational Rose 7.0 by IBM

And so on

c) Facilities:

Office facilities: binocular displayer

e) Update the original system

f) Necessary place to locate hardware device

g) Cost of fixing hardware and software

h) Cost of recruiting employers

### Other Cost for One-off Investment

* + - 1. Requirement Research & Design Research
      2. Develop Plan Research & Measure Criterion Research
      3. Cost of employing consultant
      4. Database Construction
      5. Cost for start project
      6. Cost for technology management
      7. Insurance for employers
      8. Pension for employers
      9. Training Fee

### Non-One-off Investment

* + - 1. Software rent and cost to maintain
      2. Cost of data storage
      3. Salary and Premium for employers
      4. Cost of the communication between team members
      5. The office and space rent
      6. Cost of Advertisement
      7. Public facility expense
      8. Other necessary usual expense such as the electric and water expense

## Benefit

### One-off Benefit

N.A.

### Non-One-off Benefit

* + - 1. The new hardware device and software imported can be reused in the coming projects; we can save money in the future’s projects.
      2. The experience in this project can be used in the similar projects; we can accelerate the speed and quality of new project.
      3. We can explore new market and increase the product sale if this product can gain succeeds.

### Immeasurable Benefit

* + - 1. It is necessary to adopt this solution because it’s a necessary technology tragedy when our competitors use new develop tools.
      2. The organizational planning can be improved. Every member can have a clear task.
      3. The organizational flexibility can be raised. The project plan can be modified more easily, and when facing risk, we can get a quick solution.
      4. The organizational learning and understanding can be raised.
      5. We can collect latest, better and more develop information. It can be reused in the future.
      6. The process of the workflow can be improved. The courage of team members can be activated.
      7. The team’s renown will be greatly raised. We can receive more projects in the future.

## Cost/Benefit Ratio

Project cash flow projection

|  |
| --- |
| Year Project |
| 0 -¥ ?? |
| 1 ¥ ?? |
| 2 ¥ ?? |
| 3 ¥ ?? |
| 4 ¥ ?? |
| Net Profit ¥ ?? |

## Investment Return Period

Concerning the cash flow analyze and our experience in similar project, we suppose we can have net profit in about 2 and a half years. So the investment return period is 2.5 years.

## Sensibility Analysis

1. The user experience.

If the viewing discomfort occurs, the user may be advised to send customer service a message describing the problem. Then customer service collect the message and report to developer to solve the problems.

# Other Social Factors

## Law Based Factors

* All softwares for developing are authorised edition.

## Usability Based Factors

As has mentioned above, now the HDR displayer are not so accessible. So if there is a commercial software to resolve this big issue, it will be popular.

# Conclusion

We can get a conclusion from the all the analyze above: we can start the project at once.