

# Steam Chaos Action RPG Game

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supervised by:

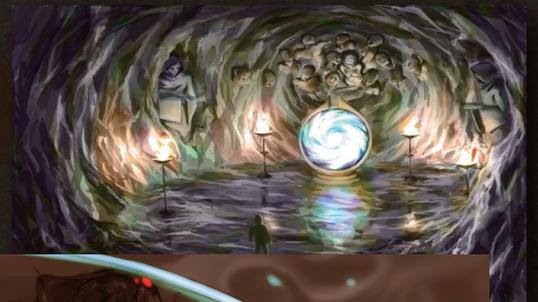
**Professor Andrew HORNER**

# STEAM CHAOS

This project aims to develop an Action Role-play Game which shows impressive graphics using shader effects and allows character customization.

## Story

One day, you went into a cave and found a portal. You stepped in and arrived at “STEAM” world. The portal suddenly disappeared, and you did not know how to go back. You met an old man and he said that you needed to find the “Soul gate”. It was the only linkage between STEAM and the real world. So you picked up your weapon and began your journey...



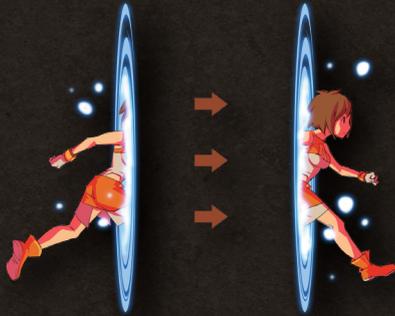
## Main Options

3 main options are provided:

- Story mode
- Battle mode
- Profile setting

## Story/Battle Mode

Player needs to wipe out all the enemies in the world. 3 helpful features are provided to ease the adventure:



### Portal

A linkage between two locations. Player can use it to travel from one place to another.



### Exceed

After storing enough 'exceed' power, player can use this to boost up its action speed.



### Item

Different types of crystals are available to be collected. Player can pick them up and get the rewards.

## Character Customization

Player can freely modify its character by changing the body parts, weapons, and even body colors!

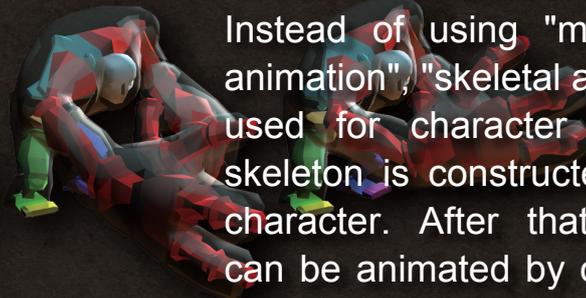


# Methodology

The game system is written in C++. Irrlicht engine is used for rendering and IrrKlang engine for playing sound. The system is separated into several system managers and runs in multi-thread. Each manager has a "message queue" for communicating with other managers. Unicode standard is used in order to support Multilanguage. XML and INI format are used for file storage. In addition, all graphic related elements are made using Photoshop. 3D models and animations are made using 3D Studio Max.

## 3D Sculpting & Normal Mapping

After in-game model is produced, ZBrush is used to "sculpt" a higher resolution model. Tangent-space normal map is then generated from this higher resolution model and applied to the original model for enhancing the appearance of 3D models.

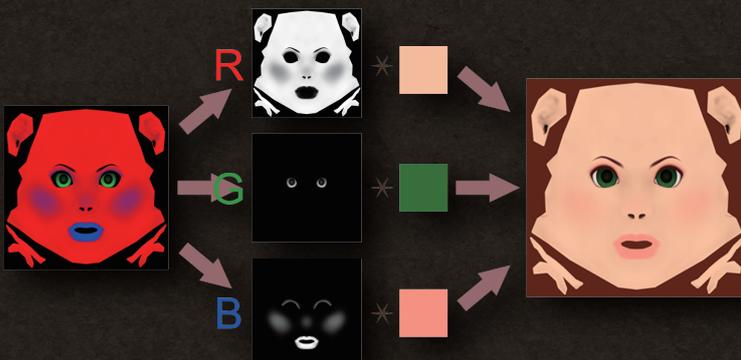
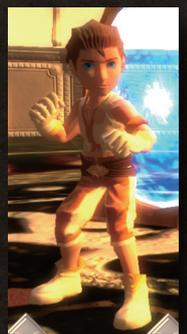


## Skeletal Animation

Instead of using "morph target animation", "skeletal animation" is used for character models. A skeleton is constructed for each character. After that, character can be animated by only moving its bones.

## Shader & Post-processing Effect

Non-photorealistic shading algorithms are used. It is implemented based on Phong Shading Model and coded with HLSL. After the screen is rendered onto an image using RTT method, this image is passed into a post-processing chain, which adds different kinds of "after effect" to the image.



## Color Region Mapping

To allow color customization, a special texture map called "color region map" is applied to each player's character body part. Each color channel is used to contain color region for one customized color. While rendering, pixel shader picks the RGB value from this map and computes the result by multiplying this value with those customized colors.