CoLabs

Design Document

Vision

The vision for CoLabs is to create an enjoyable 3D puzzle game based in a sci-fi environment. Ideally, two players play locally on a split screen as a red and blue player. This encourages communication between the players to work through the challenging puzzles together. Other options for playing the game are through networking or single player mode, which would allow one person to toggle between the two main characters.

The main mechanic of the game will be how the player's color interacts with the world. The red player will be able to do things the blue player cannot, and vice versa. Puzzles will require each player to navigate through the level in the right order. Some events will need to happen before others within the same level in order to progress. This gameplay will be linear so as to reduce the scope of the game's levels.

Target platform

Due to the ease of development and building in Unity, we see this as a platform agnostic application, barring mobile devices and PS4. Players should experience the game the same way whether on Mac, PC, or an Xbox.

The Controller

It is encouraged to use a console controller to interface with this game, one that the system being used supports. Keyboard and mouse controls will also be available, but only for single player mode.

The Player(s)

The players(s) will play as a red robot and a blue robot. Both have the same model with different color textures. Each will control their own player independently. The player will have these core mechanics while controlling the player:
1. Jumping - The user will be able to jump. This will allow them to jump onto platforms of a specific height or distance away. No ledge grabbing mechanics will be involved, so the player will either make the jump or not, as in a platformer. To jump, press (A) on an Xbox remote, or the space bar on a keyboard.
2. Walking - The player will be able to navigate around each level by walking. To walk, use the left analog stick on a controller, or WSAD on a keyboard.

3. Sprinting - By using a modifier with the walking, the player will be able to sprint in order to move faster. To toggle sprint, press the left joystick in on controller, or press left shift on a keyboard.
4. Interact - Some level mechanics will be "interactable". This will vary per mechanic. Interact with (X) on an xbox controller, or E on a keyboard.
5. Zoom - The player can "zoom" the camera in to inspect something closely. Hold the right trigger on a controller, or the left control key on a keyboard to zoom.

These mechanics serve as the interface for the user into the game world.

The Camera(s)

Each player will have a camera situated above the robots head such that the robot is in view. This is a traditional 3rd person camera position. It will be fixed at this point, but allow rotation around the player using the right analog stick or the mouse. This will feel like the camera is on a sphere centered on the player.

During one player mode, the camera will envelope the entire screen. When a player switches to the other robot, the displaying camera will simply switch to that robot's camera.

In two player local, each player will half one-half of the screen; one on the left and one on the right. These will be fixed, and no interaction between cameras will happen.

In two player networked, each player will have the entire screen to themselves.

Level Progression

Initially, a user will be able to start a new game which will drop them into the first level. Once a level is completed, the next level will be unlocked and become playable. The player will be able to replay any levels that have already been beaten through selection at the main screen. A level select menu will display levels that have been completed and will show the future levels that are still locked, and won't be accessible. Information about progression is saved in a binary file that is read upon startup of the game that will allow the user to continue where they left off last time they played.

Levels will follow a chapter-level scheme, where each chapter introduces a new mechanic. For example, Chapter 1 might be devoted to understanding end goals, Chapter 2 is devoted to understanding the phasing mechanic, and so on. The levels will

be designed such that the player will gain experience with a given mechanic during a few levels worth of puzzles involving it before a new mechanic gets introduced. For instance, within Chapter 4 - Laser Craze, there might be multiple levels. Chapter 4 level 1 might be an introduction to lasers; they kill the player of the opposite color and have no effect on the player of the same color. Then, in Chapter 4 level 2, the players will learn that the lasers can be harmful, but also serve as a power source for triggering events within the level. The goal is for the final chapters to contain many mechanics that the player will have a solid understanding of.

Level Mechanics

To create fun and challenging levels, we introduce a number of archetypal objects and mechanics for players to work with or around.

Tinted walls/floors:
A player will phase through their own color and collide with the other color. For instance, red walls surrounding a ramp would only permit the red player getting onto that ramp. A blue walkway with spikes underneath spells death for the blue player, but is a road to the end goal for the red player.
Mixed color walls will prevent both the red player and the blue player from walking through it, serving to restrict both players from part of the level.

Spikes:
Simply, spikes will harm the player, causing the level to reset. The color mechanic may be introduced here as well, allowing blue player to not be affected by the blue spikes.

Building:
Certain parts of a level may have a different material on them. When the player hovers over them, they will be prompted to interact with the object, allowing them to build blocks on them.
The blue player will be able to build and unbuild blue blocks on blue panels, and the red player will be able to build and unbuild red blocks on red panels. Purple panels are areas that both players can build on and both players will be able to collide with purple blocks.
The color mechanic can be applied to these building areas as well, meaning the blue player may be able to build somewhere the red player cannot.

Lasers:

In levels, lasers may be present. The goal for the laser may be to line it up with an object meant to receive the laser to supply power. The goal may also be to divert or reflect the laser to take away power. The lasers will be the colors of the robots again, and will be deadly to the opposite color. A red player will be able to walk through red lasers, but the blue player will be harmed, and cause the level to reset.
A "mixed" laser color will be both red and blue, and will kill any player that walks into it, while also providing both colors as a power for a power absorber somewhere in the level.

Death:
When a player dies, the robot character model explodes into pieces, and the level will be reset entirely. Both players and level state will reset to the initial state, so that players are forced to be more careful when it comes to avoiding death inducing obstacles.

The Story

Our two protagonists are in a testing laboratory, where scientists are researching a breakthrough AI algorithm for collaborative problem solving in humanoid robots. Each puzzle serves as a benchmark for how massive this accomplishment is.

Due to the unknown factors in AI programming, the tests are done in a remote laboratory. Dangers of the AI doing anything unintended worry the researchers, but they become more comfortable and excited as the robots complete more puzzles together. Is their new cooperative AI truly cooperating, though?