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Research and Analysis Paper

Our group has decided to take part in the Game Jam for Project 2. As a result, we started to brainstorm ideas under the theme “Switch”, a past 48-hour Game Development Contest. When we first thought of the theme “Switch”, gravity switching came to mind. We took this thought and wanted to build something different than the typical puzzle gravity-switching games that exist all over the place. As a result, we decided to go with a first person shooter game that incorporates gravity switching.

This concept was hard to put together, and many of the features of the gravity switching could go in different ways. Some questions we wondered included: “Will the bullets also be switching gravities?”, “Will ALL of the players switch gravity, or just one?”, “How will the gravity switch happen? Will it be a power up, or an innate ability?”, “If it’s a power up, how do you earn it, and if it’s an ability, how do you activate it?”

To answer some of these questions, we decided that every element of the game would switch gravities whenever it was activated. This is because we didn’t want two different players to be on two different gravity types. It would make it nearly impossible to incorporate this into a game, and still have everyone in danger of dying from anyone else, ruining the free for all aspect. We wanted everyone to have the ability to switch the gravity, but not so often as to ruin the fun of the game. As a result, the gravity switching will completely rotate the field of play for everyone, and for all of the bullets. We decided to make gravity switching an ability that every player would have, but is only able to activate when they reach a kill streak of 3; that is, killing 3 other players in a row without dying themselves. This power is stored on the character, and can be used whenever they desire to, but only one charge of this power can be stored. Therefore, if you save the power too long, and reach another kill streak of 3, you are not rewarded with a second charge of the power.

After setting up these basic rules for the game, it seemed slightly unbalanced, and not very fun for someone who isn’t great at the game. For example, a player who never gets a three kill streak will never get to experience the functionality of the game that allows you to gravity switch. As a result, we decided to implement the gravity switching power a little bit further. If a player dies three times in a row without getting a single kill, they will also receive this power up to be used. This power up will stay available to them until they get a kill, in which it would disappear.

As a group, we believe that incorporating this power-up adds another aspect to the first-person shooter game that incorporates more fun for the player. It allows a player to get past walls/obstacles in some gravity fields that they wouldn’t in others, or even switch gravities to block a bullet that was about to hit them with another obstacle. Furthermore, if two players are about to start shooting at each other, one with the power up ready would be able to switch gravities and gain a slight advantage over the other players.

The first game that our game is related to would be Call of Duty 4. Call of Duty 4 is a first person shooter game that implements three different types of killstreaks when killing players, similarly to our game design idea. Call of Duty 4 has a killstreak of a “radar” on a 3 killstreak, which allows you to see all other players on the mini-map, giving you a slight advantage. Moving further, if you get to 5 kills in a row without dying, your 3 killstreak disappears (if you have not used it yet) and you receive the reward of an airstrike, allowing you to place an airstrike (a set of planes drop bombs) on a chosen spot on the map, killing any player who is in that area. Furthermore, if you get to 7 kills before death, you receive the reward of a helicopter, which roams the map and will kill any players who are not hidden at the time.

Call of Duty was the main motivation for our group's idea of killstreaks. After playing nearly every Call of Duty to ever release, it becomes obvious that the main “fun factor” for them is the killstreaks you receive. Killstreaks are a way for the game to physically reward you for doing well, and to motivate you to stay alive and play carefully, rather than running around, getting 1 kill, and dying repetitively. As a result, we wanted to do something similar and motivate the player in our game to do the same. To implement this idea further, and balance the game a little bit more for new players, we implemented the “death streak” killstreak as well, as described above.

A second game that our game is heavily related to would be the mobile game “Gravity Guy”, released in 2010. Gravity Guy is a side-scrolling endless runner/arcade video game, that implements a gravity switching aspect in order to create “puzzles” inside of the game. In the game Gravity Guy, the player runs across the screen, and has the ability to tap the screen at any point in time to switch the gravity to be upside down. When the screen is tapped, the player would then be running upside down on the top of the screen. An enemy is chasing behind the main player, and if he is able to catch up to him, the player loses and goes back to a checkpoint spot. The goal of the main player is to flip the gravity whenever an obstacle gets in their way (so that they can go over it), or when the blocks on their side of the gravity are about to disappear (to the point where the player would just fall off and die if they don’t switch the gravity). The enemy is coded in to always follow the correct gravity regardless of what the player does (they are separate entities), so that if a player gets stuck behind an obstacle for too long before realizing they need to switch the gravity, they will lose.

The main mechanic of Gravity Guy is the gravity flipping, which was the motivation for the gravity flipping of our game. We were able to build off of this concept in a completely different way, but have it act very similarly. Furthermore, Gravity Guy was the main reason that the questions such as “Will all of the players switch gravity? Or just the player who uses the power-up?” arose. In Gravity Guy, the gravity flipping only affected the main runner who used it, so that the player would not be able to influence their enemy and give themselves a further advantage. However, in our game, we needed the exact opposite -- we *did* want the player to be able to influence the enemies and give themselves an advantage as such. Putting this aspect in our game allows a competitive nature to arise. We wanted players to have that feeling of “upset” or “frustrated” at other players, in order to change up the game and not make it feel linear. Furthermore, when you have the ability to change the game for everyone, and not just yourself, you get a higher sense of “success” when you win. It makes you really feel like you beat everyone else.

Cube Koala, a popular platformer on the app store, also makes use of the gravity flipping mechanic. But it does it a little differently. By allowing the player to change the gravity by a factor of 45 degrees (rather than a 180 flip), the developer was able to take a boring mechanic and refresh it. This mechanic, in turn, introduces a multitude of new level designs and design challenges.

Rather than just allowing a simple 180-degree gravity flip, we could take this mechanic from Cube Koala and create more interesting FPS levels. This will force players to think creatively about the levels they traverse. What was once a mere slope can now be seen as a new path to kill an opponent. We could go further and allow players to only change gravity in certain directions.

While this kind of gravity flipping gives players a sense of more freedom and mobility, it provides yet another challenge to designers. What if we intentionally want to block off some parts of the map? What if we’re in an open-world scene? Will all levels have to be *enclosed* on all sides so as not to let the player fall infinitely? Cube Koala takes the easy route and encloses all levels either with walls or spikes/lava. Our FPS could answer this by allowing players to wrap around an open scene, Pac-Man style. This will lead to unique PvP encounters and even more interesting levels.