Research Paper

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Tumbleweed Dodgeball is a 2-4 player competitive party game in which each player controls a cowboy. Players can pick up and throw tumbleweeds (and later other objects) at one another to score points. The mechanics and gameplay make *Tumbleweed Dodgeball* unique, but also similar to other games, such as *Stikbold!*, *Towerfall*, *Robot Roller-Derby Disco Dodgeball*, the *Mario Kart* series, the *Super Smash Bros.* series, and *Custom Robo*.

Mario Kart

Although the *Mario Kart* games are built upon racing other players, not throwing dodgeballs, this series has many similarities to *Tumbleweed Dodgeball*. Many of the key resemblances come from *Mario Kart*'s classic racing mode, in which all players race individually against each other as well as some number of NPCs. The first similarity is that both of these games are free-for-all competitions. Using this style of game drives the party nature of both games by letting players specifically target their friends.

However, *Mario Kart* allows players to include some number of NPCs to race against the players. This feature is not included in *Tumbleweed Dodgeball*. In *Mario Kart*, the use of NPCs keeps the game feeling full, even when only a small number of human players are included. This is very important because the maps in *Mario Kart* are very large. If each map only included a few racers, the racers would quickly spread out and the game would become very boring. In *Tumbleweed Dodgeball*, NPCs are left out because the maps are not nearly as large, so the game will stay interesting even with only two players. Furthermore, NPCs in simple racing games like *Mario Kart* are much easier to balance so that they are not perfect and win every race every time, but are still challenging enough to be a threat to the human players. This would not be as simple in a game like *Tumbleweed Dodgeball* because there are many different strategies and developing a balanced AI system would be extremely difficult and could not be completed within our timeframe. Another similarity between these games in the use of several rounds to declare an overall winner. In *Mario Kart*, players race a total of four races per game and score points depending on where they place in each race. At the end of the four races, each player's points are totaled and the player with the most points wins the game. A similar strategy is used in *Tumbleweed Dodgeball*. Three rounds are played in each game, and players' points are totaled at the end to determine the winner. Points are gained by throwing tumbleweeds at other players. This is done to avoid the players getting frustrated as well as giving them a chance at a comeback. If one player has a particularly bad round, they haven't necessarily lost the game, so they will keep playing rather than give up completely.

Stikbold!

Stikbold! was developed by indie studio Game Swing in 2016. Much like *Tumbleweed Dodgeball*, Stikbold! is a free-for-all multiplayer game in which players play dodgeball against each other in an open arena.

Stikbold! is similar to *Tumbleweed Dodgeball* in many ways, but it's really the differences that are interesting. First of all, in both Stikbold! and *Tumbleweed Dodgeball* the player can "charge" their throw to make sure the ball has more power as it travels. In Stikbold!, if the player holds down the trigger then the throw will be charged to a maximum until the trigger is released, i.e. charging can only increase. When we were working on *Tumbleweed Dodgeball* we decided to change this mechanic so that charging works a little differently. In our game, when the trigger is held down, charging

of the ball goes up and down, and the player has the ability to choose the power with which the ball is thrown. With this mechanic the player is required to interact even more with the game and has to make decisions about the power used. Furthermore, in Stikbold!, once the trigger is held down, the player is frozen to the current position and can't move around until the ball is released. We decided that for *Tumbleweed Dodgeball* the player should still be able to move around while in the process of throwing the ball, but to make sure that players don't just always keep the ball charging we decided that once a player starts charging then the player's movement is slowed down. This, in our opinion, makes the gameplay more fun because again the player has to make decisions but is not too limited in movement.

Another big difference between Stikbold! and *Tumbleweed Dodgeball* is the actual gameplay. In Stikbold!, there is only ever one ball which can be thrown around. When a ball is thrown, another player can't catch it unlike regular dodgeball. When we were designing our gameplay, we figured that only having one ball would make the game too simple and not entertaining enough, because we figured with more balls then there'd be a more chaotic/hectic tone to the gameplay which is what we had in mind. Furthermore, we decided to give players the ability to catch balls and gain points from that which is more in line with the rules in regular dodgeball. This means that players who currently don't have a ball are not limited to just stay away from other players, but can actively challenge them to throw the balls. It makes the game a little more difficult for the throwing player too, because that player needs to make sure that the ball comes with

surprise. Because there are more balls, another major part of our gameplay that can't be found in Stikbold! is that each player has the ability to hold two balls, one in each hand, at any given time. If a player holds two balls however, then the player can't catch any incoming balls (no hands available). This means that players need to consider whether to hold on to balls or just throw them instantly. Again, player interaction is more required in *Tumbleweed Dodgeball* than it is in Stikbold!, which we think makes the gameplay more fun.

Lastly, when we decided that we would have more than one ball present in the gameplay for *Tumbleweed Dodgeball,* we also decided that it would be fun if some of these other balls had some special abilities. This is also much different than Stikbold!, because, as mentioned earlier, in Stikbold! there is only one type of ball. Our reasoning for having various types of balls was based on the gameplay in Stikbold!, which at times was too easy and could quickly become repetitive. With the various balls, the gameplay becomes more dynamic and non-repetitive, given that these special ability balls will spawn randomly in certain maps and players will be forced to change their strategy for winning as these balls are spawned.

Robot Roller-Derby Disco Dodgeball

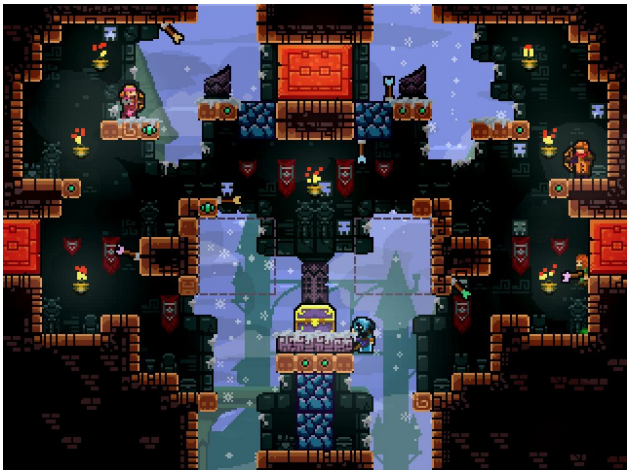
Robot Roller-Derby Disco Dodgeball was created by Erik Asmussen and released on Steam in February 2015. Disco Dodgeball is a first-person dodgeball game.

Being a dodgeball game, Disco Dodgeball resembles *Tumbleweed Dodgeball* in many ways, but one main difference is the fact that Disco Dodgeball is played in first-person view. Using a first-person camera makes the gameplay feel more individual and immersive, but at the same time it is more difficult to see other players on the field and be aware of the whole picture of what is going on in the game. When we designed our gameplay, we decided not to use a first-person camera view based on our playtests of Disco Dodgeball. Specifically, we knew that we wanted to make a multiplayer game and if we were to create a first-person view then we would have the problem mentioned above, the fact that people would not be well aware of their surroundings. The main advantage of the first-person view is that it is easier for the player to catch balls.

However, when we played Disco Dodgeball and then went to implement our own gameplay, we figured that being able to see the whole playfield would make the gameplay better than easily being able to catch balls, mostly because the whole gameplay would feel more like an arcade game and casual, as compared to Disco Dodgeball. This is turn goes more with the feel of a game that we were aiming towards creating.

Another main difference with Disco Dodgeball as compared to *Tumbleweed Dodgeball* is the fact that the world in Disco Dodgeball is in 3D, and the player can move around in all directions, not just on one plane. This makes the gameplay bigger in the sense that there are more planes to play in, but also it makes the game more difficult because now the player has to take into consideration gravity and angles when trying to hit players from a far distance. In *Tumbleweed Dodgeball* there is only one plane in which the game takes place. We made the decision for the gameplay to be like this because we wanted the gameplay to be more casual, in the sense that player can easily just throw the ball in the game and have some fun, not requiring them to think too hard while considering the right angle to throw the ball. Furthermore, with different planes then the arena can easily become too big, and in *Tumbleweed Dodgeball* where there are no NPC's, then players might go a long time without meeting any other players simply because all players are on different planes.

Towerfall



Towerfall is an action game where up to 4 players shoot arrows at each other until there is only one player left in the round. At the end of the round, each person's kills are added up until one person reaches a certain score and they are declared the winner. In this game the players can gain kills by both shooting the other players with arrows and jumping on their heads.

With this multiplayer experience Tumbleweed Dodge ball has a similar feel to Towerfall. It is meant to be a fast multiplayer experience where players are aiming to have the highest score. In both of these games there is a limited ammo system that is replenished by picking up already fired arrows or tumbleweed from the ground. The difference comes in where the players in Tumbleweed Dodgeball are able to decide which type of ammo will be used while in Towerfall they must use the next arrow in line. Another similarity we wish to show in Tumbleweed Dodgeball is is the fast paced rounds where score is kept over each round and at the end a winner is declared. In Towerfall, each round is decided by all but one player dying. This keeps the rounds short and

allows for a player to gain an advantage by keeping alive and letting them get more of the points. While we like to have quick rounds in Tumbleweed Dodgeball, we also like to keep all the players playing at once, so we use a point based system with timed rounds to keep the action going. In our game players are able to go into a negative score so if they start falling behind early they will need to work to get back in the game.

Lastly, Towerfall has a system to allow people to pick up powerups that either protect them or enhance their fighting powers. They are also able to pick up special types of arrows that have different effects than the regular arrows. In Tumbleweed Dodgeball we also have powerups that the players can pick up to gain advantages and they also can throw one time use balls that have different effects relating to how they look. For example, a pile of cow dung leaves behind a smelly trail that slows people or a hot coal travels faster than other balls.

Super Smash Bros.

Games in the *Super Smash Bros.* series are single and multiplayer crossover fighting games, centered around the unique attributes of each character, stage, and item. While *Tumbleweed Dodgeball* may not seem immediately similar, there are a few subtle similarities in gameplay.

The first of these similarities is the unique stages present in each game. In *Super Smash Bros.*, there are dozens of stages, each with their own stage hazards. This makes the gameplay feel new and unique each time it is played, rather than quickly growing boring by playing on the same stage over and over again. *Tumbleweed Dodgeball* features multiple maps to play on as well, similarly containing unique environmental features. Furthermore, *Tumbleweed Dodgeball* and *Super Smash Bros.* both use the concept of spawned items used to get more points from other players. In *Super Smash Bros.*, these items randomly appear throughout the stage. This works well for this series because there is such a large number of items, so the mystery of which items will appear next add an element of suspense. However, in *Tumbleweed Dodgeball*, the items will only appear at fixed locations. For example, a cactus fruit, which is uncatchable by other players, will only spawn near a cactus on the stage. This means that players do not have to worry about items as much and can focus more on actually hitting other players with balls. In addition, only certain balls and powerups will spawn on each stage. This allows players to feel comfortable playing without having to memorize dozens of different items and their unique effects. Instead, before choosing the stage, players are shown which items will appear, along with a basic description of their effects.

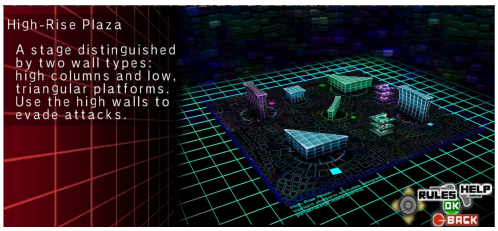
Custom Robo

Despite their extreme thematic differences, scifi game *Custom Robo* and western styled game *Tumbleweed Dodgeball* both fall into the same top-down competitive action genre. Both games involve moving a character around an arena shooting projectiles to take down other players. Despite *Custom Robo* having an emphasis on, as the name suggests, customising your robot with different guns, bombs, mines, and armor while Tumbleweed dodgeball has no customization (outside of cosmetics), the core game loop of both games is similar enough that we were able to use it as a valuable resource for designing our levels and special balls/powerups.

A feature offered in both our game and Custom Robo is a number of diverse stages that players may fight on for a single, quick round. During early playtesting we found having a single, well polished stage that players would play in for the full ~5

minutes was not the best idea as we quickly found ourselves getting tired of the same environment and strategies. Custom Robo likely also recognized this need to diversify their assortment of stages and does so through over 20 different “holloseums”. These are designed to offer different styles of play from small, close quarter stages to large open ones. We tried to replicate this level of variety in Tumbleweed Dodgeball by including a variety of stages that incentivize different types of play. We also saw that Custom Robo was able to further develop these different playstyles by allowing the player to customize their robot to work better on a given stage, so we tried to do something similar with how we approached our special balls and powerups. Instead of including our entire set of special balls and powerups on every stage, we chose to include a smaller set where they would be most effective given the arena. This is similar to how Custom Robo encourages specific robot parts to be used on different arenas, just without the player customization.

One major difference however is that Custom Robo offers full 3D movement instead of the more constrained 2.5D movement Tumbleweed Dodgeball uses. The developers were likely looking to expand the strategic aspect of their game by offering the players more options with movement and positioning. However it’s hard to say this is a direct improvement over 2D constrained games like Tumbleweed Dodgeball. A holosseum like “High-Rise Plaza” (shown right) is an example of a stage design that isn’t possible in Tumbleweed Dodgeball as it uses both tall and low walls that block the player in different ways. While the 3D approach creates a different way to play



the game it's hard to tell if it's a direct improvement over the 2D approach. In Custom Robo players don't have to aim their attacks as it would be extremely difficult given that the player would have to take both direction and depth into their shots. As we're trying to include aiming (and struggling with making it possible to hit other players consistently) a real 3D approach may be a bit difficult to implement, but perhaps we shouldn't have written it off so early due to the benefits it provides Custom Robo.

View a gallery of Custom Robo stage screenshots we gathered here