Paper Prototype

Game Programming Lab 2016
Jessica Falk, Sandro Lombardi, Sandro Ropelato, Don Schmocker
21st March 2016

Rules

The game starts with each player standing on his start location. The fruit spawn point (see below) closest to each player is equipped with three apples.

At the beginning of each round, one additional fruit spawns at a random location.
Then each player decides between the following three actions:

- **Eat an orange**: By eating an orange the player becomes invulnerable for this round and the next

- **Shoot**: He decides to fire one of the fruits in his inventory on an enemy of his choice. Dice decide whether or not the shot is successful (see below). If hit, the enemy drops a certain amount of fruits in his inventory which are scattered on the board by dropping them from 2 cm over his token (see figure 3) and the player who fired the shot is given points (one for the successful shot and one for every fruit dropped by the enemy). The fruit used to fire is lost (i.e. returned to the box). The amount of fruits dropped is determined by the rules defined below. The player being shot can decide which fruits he drops.

- **Move**: The player can move his figure up to five fields. He can not walk through obstacles. If his path crosses a field on which a fruit lies, he picks it up and takes it into his inventory.

The order of the actions is as listed above (i.e. a player who wants to eat an orange does so before another player can shoot and a player who wants to move can only do so after all shots have been fired).

If two players intend to pick up the same fruit during one round, the one needing less moves gets it. If they both need the same amount of moves to reach the fruit, the die decides (e.g. 1 - 3: player 1 gets the fruit, 4 - 6: player 3 gets it).

The same rule applies when two or more players shoot at the same opponent. In this case, the die determines the order in which they fire.

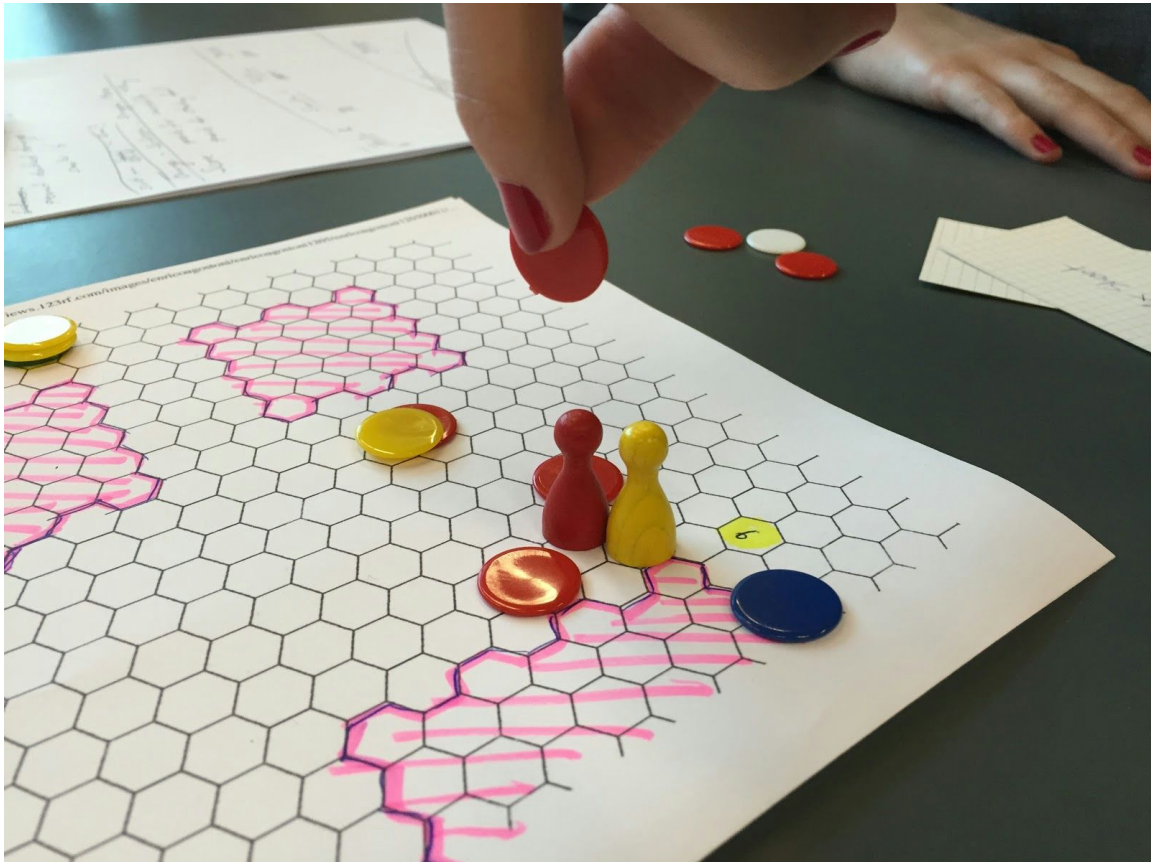An item being used to fire can not be dropped in that round.

The game is played for either a predetermined number of rounds or a defined amount of time. The player with the most points wins the game.

Fig. 1: Board with players and fruits.

Fig. 2: Dice determine what fruit spawns where.

Fig. 3: Dropping a fruit after being shot.

Available Fruits

The **apple** (red coin) is the standard ammunition. It doesn't provide any special abilities and has the highest drop rate. When using the apple, the player has to select another player that he want to shoot with it. The player hits the selected target successfully, if the rolled die displays a number that is larger than the shortest distance, counting the number of fields between the two players, divided by two. If the shot is successful the player who has been hit will have to drop 20% (rounded up) of his fruits.

The **banana** (yellow coin) acts like a boomerang. The player also has to select another player and the shot is successful, if the rolled die displays a number that is larger than the shortest distance between the two players divided by two. If the shot is successful, the player will have to drop 20% (rounded up) of his fruits. Furthermore, the player who was hit, is stunned and has to pass the next round. However, there is a possibility, that the banana won't break and that the player can use the fruit again. To decide, whether the banana stays in the inventory of the player, he has to roll another die. If the die displays a number smaller than four, he can keep the banana.

Peanuts (white coins) give the opportunity to inflict higher damage on the selected player. The probability of a successful shot is lower than using the banana or the apple (50% lower to be exact), but if hit, the player will have to drop 40% (rounded up) of his fruits. To make a

successful shot, the rolled die needs to display a number that is larger than the shortest distance between the two players.

The **melon** (green coin) gives the player the possibility of hitting multiple players at once. Instead of selecting a player, he can select to which field (in a radius of 6 fields) he wants to shoot the melon. All players in a radius of 3 fields will be successfully hit. Depending on how close the player is to the selected field, they will have to drop a different amount of fruits. If the one throwing the melon is standing too close to the selected field, he will also get hit and has to drop fruits. However, he won't get any points from hitting himself.

- Player is standing on the selected field: He drops 40% (rounded up) of his fruits
- Player is standing one field away from it: He drops 30% (rounded up) of his fruits
- Player is standing two fields away from it: He drops 20% (rounded up) of his fruits
- Player is standing three fields away from it: He drops 10% (rounded up) of his fruits

The **orange** (blue coin) is not used to attack other players. If the player has an orange, he can eat it to gain a shield for two rounds. This will protect him from all shooting attempts during that time.

Fruit Spawn Points

At the beginning of each round, the dealer (any player) rolls two dice. The first one defines which of the six fruit spawn points is equipped with an additional fruit, the second one determines what sort of fruit will be spawned by the following rules:

- 1 or 6: Apple
- 2: Melon
- 3: Peanut
- 4: Banana
- 5: Orange

If a player happens to be standing on the fruit spawn point at the beginning of the round, the fruit will directly go to his inventory.

Experience

During the development of our physical prototype, we created two version of a possible board game. Both share the same rules as explained above, but create a different kind of feeling during playing.

In the first version, all players share one board. This is equal to a "mini-map" displaying all the player and fruit locations in a video game. At the beginning of each round, one player rolls the dice to decide the next fruit spawn point. The next step is for all players to decide on their action during this round and to actually start the round. At the end of the round, the dice will get passed to the next player.

While it was fun to play, we weren't able to completely convey the game feeling that we had intended. Being able to see the locations and actions of all players at all times made the game less strategic and it wasn't as intense as we had hoped it to be.

That's why we decided to test a second version. In this one, each player gets his own board and one player acts as the "computer" synchronizing the states of all boards. The task of the "computer" is to decide the fruit spawn location at the beginning of each round and to update the boards of all players. The players are only able to see each other, if there is no obstacle between them. Therefore, the "computer" needs to check the position of all players in each round and only place tokens of other players on the board of a player, if the player can see them. He also needs to update the position of the fruits on all boards. After deciding on their actions, the players indicate the chosen action to the "computer" who decides on the order that they should be acted out according to the rules. The boards represent a "mini-map" that displays only the fruit locations.

After playing this version, we concluded that this one represents our game better. It is more strategic and it provides more suspense to the players as they don't know what the other players are doing. However, if there are more than two players, it becomes difficult to play without the game getting too slow, because the "computer" needs to update all boards accordingly.

Improvements and Design revisions

Several questions arose during our playthrough of the paper prototype. The individual questions with the corresponding improvements and design revisions are listed in the following:

Question:
How does the orange protect the player? Do others still get points for hitting the player who ate an orange or does the orange only protect from food loss?
Design decision:
Whoever eats the orange is protected from food loss. Furthermore, players hitting another player who is currently under the effect of an orange, do not gain any points, in particular neither for the successful hit itself nor for any food drops. In other words food used to hit such players is wasted with no effect. But to decrease frustration of wasted food, we want to indicate the orange's effect by visual and auditive hints (comparable to the star in Super Mario).

Question:
Melons have an area of impact. Thus, what happens if the player who shot the melon is within the radius of impact?
Design decision:
We agreed that the player himself can take damage, i.e. he is able to drop food as a consequence of getting hit by the melone he shot. However, the player will not get any points (for hitting himself) as this could lead to exploits of the game mechanic. This decision

encourages the careful handling of melons and the use of tactics (e.g. eating a orange right before shooting a melon to the ground).

Question:
How often should food spawn? Should it spawn at different locations simultaneously?
Design decision:
Often we would just run around looking for the next spawn point with food during our playthrough of the paper prototype. Thus, we agreed to have the food spawn rather often and at multiple locations simultaneously to not decrease game experience only because one runs out of food. Food is destroyed if shot, therefore the food spawn ratio must be high enough to cope with wasteful food use of the players.
As a lot of waiting for the next food to spawn happened right at the beginning, we decided to let the spawn points have some food items ready right at the start of a game.