

Department of Computing and Networking

Games Degree Year 3

***Game Design Document***

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**Functionality planned**

For our second iteration we plan to have the following features implemented into our game:

* Random shapes user story: as a user I want all random shapes spawning and acting appropriately (falling at the right speed, proper collision with other shapes and matrix) with use of the seven bag algorithm.
* Level progression user story: as a user I want when a full grid square is cleared the my score is now increased and displayed on screen, the speed of the falling blocks to increase, and I want to earn more points for each grid square cleared.)
* Audio user story: As a user I want suitable music and sounds to play when expected
* Instant drop user story : as a user I want to be able to press space and the according block/shape to be dropped instantly into position.
* Display next shape user story: As a user I want to be able to see what the next shape will be before It is used.
* Shape shadow user story: As a user I want darkened grid segments below the shape and on each side of the viewable grid to allow ease of movement.

**Game Mechanics**

**Space**

The game world consists of a three dimensional well in which the shapes fall and are placed into. This matrix is stored inside a larger environment that consists of a plane that the grid rests on and a space skybox.

The two 'spaces' don't really have much contact with each other besides the grid resting on the plane, the outer larger space exists only to add to the game environment.

The user only has control over the moving shape's inside the grid 'space' eg: the 5v5x11 well, it resembles the real world in the way that the shape automatically fall down wards as if gravity was acting on them except they don't fall straight down, they are timed to stop and start falling to give the player a chance to decide where to place them. The speed at which they fall is also increased with each level.

**Objects**

* The player interacts with the current falling shape by moving it into a desired location within the grid.
* The player can interact with the camera rotating it to get a better view of the grid.
* The grid is an object that the player appears to interact with but cannot alter it in anyway, it exist purely for collision detection purposes and to help the player achieve a cleared square.

**Actions**

The player will interact with the game as follows:

Left: To move the shape left.

Right: To move the shape to the right.

Space: To instantly drop the shape into place

Shift: Store the current shape or swap it with the shape in storage.

W: Rotate the shape forward on the z axis.

S: Rotate the shape back on the z axis.

A: Rotate the shape left.

D: Rotate the shape right.

1: Rotate the camera left.

2: Rotate the camera right.

**Rules**

The player's objective is to clear as many full grid squares as fast as they can by moving and rotating the shapes they are given. Their level increase when a certain amount of grid squares have been successfully cleared, with each new level the speed of the falling shape's increases and so does the amount of point earned for each cleared square. If the blocks stack up beyond the height of the matrix then the game is over.

**Skills**

This is a puzzle solving game so the skills required are mental. The player is required to fit together the many spawning shapes that fall to complete a full grid square, this becomes increasingly more difficult because the speed of the shapes increase per level requiring the player to be able to identify suitable places for the shape to go as quick as possible, without letting the shapes stack up higher than the matrix.

Skills - every game requires players to exercise certain skills (physical, mental, social skills).

**Chance**

The sequence the shapes fall in is determined with use of the seven bag algorithm. This algorithm states that if one shape has been used out of whatever amount of shapes then this shape cannot be used again until every shape has been cycled through once. This means the only time the player will get a shape twice is when the last shape of a cycle and first shape of the next cycle are equal.

This will greatly help game play as the player cannot continuously get the same shape as it is not completely random. It will help the player have much more of a chance positioning shapes appropriately with this approach.

Another aspect of chance we were thinking of adding is the idea of an awkwardly shaped difficult to place shape being given to the player at random but very seldom. This will help with difficulty and could cause confusion to the player adding a fun, different, difficult element to usual game play. This will be an add on to the existing game so it will be one of the last things we will implement depending on time and position of completion.

**3. User and Developer Stories**

The details of all user and developer stories should be contained in this document which will evolve throughout the project.

**The description of the user stories with storyboards should contain enough detail that if you gave the description to another developer, he/she could develop the feature without any further input from you.**

Each user story must be presented with a title, description, conditions of satisfaction. It must also have an associated storyboard (developer stories may not need a storyboard). Sample stories are presented below.