Harpoon game

By Luke Allenhj

Contents

[Analysis 3](#_Toc25531281)

[ Problem Identification – 3](#_Toc25531282)

[ Stakeholders 4](#_Toc25531283)

[ Computational Approach 4](#_Toc25531284)

[ Research of the problems 4](#_Toc25531285)

[ Interviews 5](#_Toc25531286)

[o Continuous game 5](#_Toc25531287)

[o Levels 5](#_Toc25531288)

[o Level builder 5](#_Toc25531289)

[ Hardware specifications 5](#_Toc25531290)

[ Software specification 5](#_Toc25531291)

[ Specify the proposed solution 5](#_Toc25531292)

[ Limitations of the solution 6](#_Toc25531293)

[Design 7](#_Toc25531294)

[User interface 7](#_Toc25531295)

[Algorithms 7](#_Toc25531296)

[Design of AI algorithms 7](#_Toc25531297)

[Implementation 8](#_Toc25531298)

[Testing 9](#_Toc25531299)

[Evaluation 10](#_Toc25531300)

# Analysis

## Problem Identification –

There are multiple online arcade games where people are able to play for short periods of time, whether it is in their lunch or coffee break or they just want to relax for a short amount of time. Although one major problem is that people get bored of these arcade games quickly due to there repetitiveness and lack of anything different. Another major problem is that a lot of people are split into preferring either reflex-based, intuitive, or creative games.

My idea is to create a game with all 3 different genres of arcade game, whereby the games is split into 3 different sections: Continuous, levels and self-built.

Continuous is a solo player unlimited score game where the player will press space to turn a gun on the screen, once player releases the space button, the gun will shoot a harpoon. If the space button was released at the correct time the harpoon will hit the next wooden block and the gun will replace the wooden block and you will be able to spin the gun again. This will be the reflex-based part of the game due to the fact that the speed at which the screen comes down and the speed at which the gun will turn will speed up. Every time you hit the correct wooden block a point will be added to your score – the aim of the game is to get the highest score therefore friends can compare results and compete in who can get the highest score. The wooden blocks will spawn above the gun and with random x coordinates.

In levels, I will have 6 levels to do. Here I will have already pre-made 6 levels, 3 of the levels will be speed trial and 3 will be puzzle (puzzle type is where there are many possible blocks that you can hit and many different routes but only one of the routes will get to the finishing block, speed trial is when there is 1 route which all get to the golden block but the main aim is to get to the golden block as fast as possible). This part of the game includes a mix of reflex-based and intuitive To be able to play level 2 of the speed trials, you will have to get a silver medal at the least in level 1, and to be able to play puzzle 2, you will have to have completed level 1 of the puzzle levels.

In Self-built, which you can unlock after reaching a score of 20 in continuous. To start off the creation of a level, the creator will need to state the name that they are giving the level, how hard they would rate the level out of five, and whether it is a puzzle level or a speed trial level. After this they will be able to start making their course, they’ll do this by selecting the colour, red or blue and then they will create areas made up of rectangles, after they create the rectangle they will then be able to turn they rectangle they created. After this they will be putting down their wooden blocks, golden block(s) [if more than one way to win] and checkpoint blocks if it is a really long speed trial. This final part of the game is a mix of intuitive and creative arcade games. This also allows more social activity as you will be able to share levels.

## Stakeholders

My stakeholders will be those in the general public with free time to spare. My main targets in the general public will be those less than 70; this is due to the people above 70 have significantly slower reflexes and therefore it will be hard for them to get scores exceeding 15.

The main targets will be kids in the age between 6 and 22 due to the amount of free time the possess and the higher percentage of gamers in the age group. The main target age bracket dropped to age of 6 because this game allows young kids to be creative in making levels and should help their non-verbal areas as they will be solving puzzle type levels as well. Specifically, my 6-year-old cousin Ki would be a stakeholder as it would help his creative side and also help his reflexes.

## Computational Approach

I believe this is a computational problem because the main problem is to create a game that has all 3 types of arcade games. By definition an arcade game is a type of computer game, this is because there aspects to these solutions that require a computer; for example the enemies need to control themselves and the screen needs to move itself downwards at a certain pace which might not be possible for a human due to time consuming equations. Also, another large problem is that this game is quick so that the clients will be able to play a game in their coffee breaks. If this was a board game, then less people would play because it is time consuming to set up.

## Research of the problems

* + Research the problem and solutions to similar problems to identify and justify suitable approaches to a solution
  + Describe the essential features of a computational solution explaining these choices.
  + Explain the limitations of the proposed solution (not 3D)

Continuous - mr gun,

Levels – angry birds

Level builder - Happy wheels game maker, super smash bros brawl, Minecraft

## Interviews

* + What do they want (enemies? gravity? Scoreboard? Time?)

### Continuous game

1. Would you like to see the score as you go, or would you like to only see it after you have died?
2. Do you think there should be trick wooden blocks later where they look slightly different and therefore if you attach onto them you die?
3. Do you think I should add extra wooden blocks so that you can get points quicker?

### Levels

1. Do you think that the user should have to get to a certain score on continuous to unlock levels?
   1. If so, what score do you think it should be?
2. For speed trial do you think that the time should be shown on the screen whilst the game is playing?
3. For puzzle do you believe that the screen should move vertically, horizontally or in direction of movement?

### Level builder

1. Do you think there should be a change in game control settings?
   1. If not, do you believe moving the screen should be done by (left mouse button held down + movement of cursor) or (button pressed [e.g. p] + movement of cursor) or (up, down, left and right keys)?
2. Should the blocks be created by using specific keys for specific blocks or by selecting a block from a list of blocks?
3. Should the blocks be selected using the left click of a mouse or by the blocks being numbered and then pressing on their number?
4. Should the rotation of a block be like the rotation of an image in word, using a bar or an entry of no. of degrees on the image?
5. Would you like to be able to scroll in and out of level when editing it?
6. Should player be allowed to scroll in and out of level when playing it?
7. Should the creator of a level have to complete the level for it to be classified as ‘playable’
8. Should editor be able to increase size of wood.

Questions 1 and 5 are there to see the proportion of people dislike having constantly changing numbers in the corners of the screen because it distracts them, question 2 is asking to see if the clients would like the game to get harder, after certain scores or whether they would prefer the game to just get faster. Question 3 is asking if the clients would prefer the game to be sped up at the start or not. Question 4 is to see if the clients would like an objective in the continuous area instead of just having to get highest score. Question 6 is there because most puzzles might not be linear, therefore the screen might have to move in different ways.

Question 7 is there because some people may like to change the game controls whereas others might want fixed original keys. Question 8 is to see who would find who prefers creating blocks quicker or easier.

## Hardware specifications

My hardware has

## Software specification

* + What type of computer (android or apple)?

## Specify the proposed solution

* + Specify and justify the solution requirements including hardware and software configuration (if appropriate)
  + Identify and justify measurable success criteria for the proposed solution.

Success Criteria

**Necessary**

1. Continuous – when you press space, the harpoon gun will spin
2. Continuous – when you let go of space, the harpoon gun will go in the direction that it is pointing
3. Continuous – there is a death page that shows up when you die which will contain following:

* Score
* Back button
* Play again button
* Settings button

1. Continuous – the screen will scroll down
2. Levels – the levels will be unlocked when the necessary requirements are met (the previous level is completed [within a certain amount of time])
3. Maker – can do the following:
   * Add blocks
   * Delete blocks
   * Move blocks
   * Rotate blocks
   * Create checkpoints
   * Create finish points
4. Maker – the levels can be saved, opened and played.

**Good to have**

1. Settings – you can choose the following:
   1. background image
   2. KLC
   3. BLC
2. Continuous – the death screen will fade the game and then have the box on top
3. General – there is a settings button at the top right corner
4. Maker – has a start page where you enter details of the level:
   1. Name
   2. Creator
   3. Time limit
5. Boosts

**Aspirational**

1. Maker – includes aspects of gravity like:
   1. Can create specific areas of gravity
   2. Can control the level of gravity of gravity
   3. Can adjust the strength of the gravity
2. Maker – lines can do following:
   1. Lines can move back and forth in set directions
   2. Lines move a specified amount
3. There are optional sound affects

## Limitations of the solution

# Design

## User interface

## Algorithms

## Design of AI algorithms

# Implementation

# Testing

# Evaluation