Flappy Bird-Concept

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1 Flappy Bird - Background

Flappy Bird is a very popular mobile game developed by a vietnamese video game artist in year 2013. The game is developed on following mechanics :

- The game has a side-scroller background.
- The player has to tap the mobile screen to lift the bird to strategically move through series of green pipes.

2 Flappy Bird - Concept Sketch

Our team "Think Visual" decided to explore visual programming for creating an interactive flappy bird game in Max 8 using Jitter objects. The game will require players to navigate the bird through obstacles using voice pitch/gain. We will be providing navigation option via keyboard key press additionally. If the bird gets hit with an obstacle then the game is over and will restart. We intend to implement the part where users will be able to see their achieved score. Concept sketch in 1 is a rough conceptualization of how our game is going to be implemented.

2.1 Concept Mechanics

The components that will be implemented for the game are as follows (please see the numbering of objects in image 1):

1. Background Image: A side scrolling background image to display the game background.
2. Bird Sprite: A sprite that represents the player-controlled bird.
3. Pipe Sprite: A sprite that represents the pipes that the bird must navigate through.
4. Score Counter: A counter that keeps track of the Players/Users score.
5. Ground Sprite: A sprite that represents the ground where the bird is flying over.
6. Collision Detection: A function that detects when the bird collides with a pipe or the ground.
7. Gravity and Jump Mechanics: A system that simulates the effects of gravity and allows the Players/Users to control the bird's upward movement by tapping a key or using their voice pitch/gain.
8. Audio Input: Audio input for when the audio is played by the player/user for the bird to move.

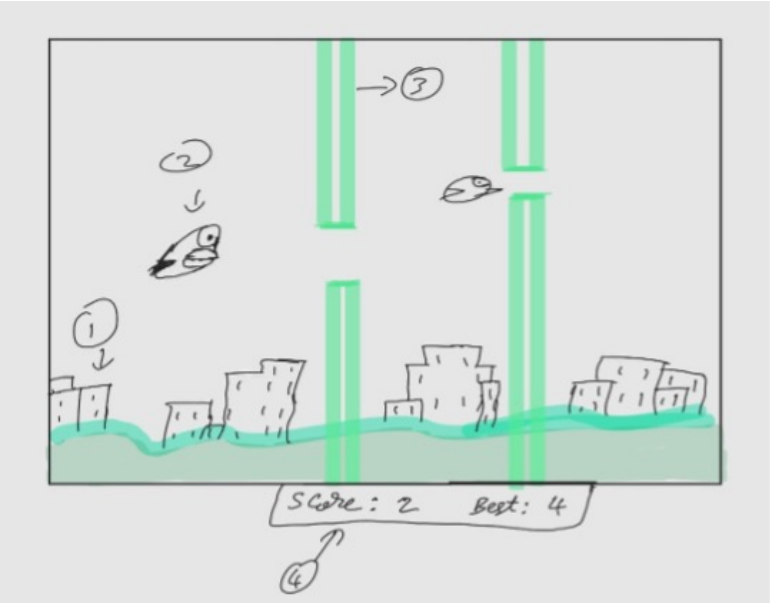

Figure 1: concept-sketch

3 Technologies

- Software: We will be using the visual programming language Max version 8, we will use the libraries like jitter and openGL.
- Hardware: Personal computers with Max 8 installed.
  We will be referring to Max 8 examples to help us in building required game components.
  We intend to finish the key tap controlled bird navigation first. If we will have some time left to finish the project, we will work on the audio input to control the bird movement.
  We will be using Flappy Bird sprites from resource available for free :
  https://www.spriters-resource.com/mobile/flappybird/sheet/59894/

3.1 Implementation Approach

- A game window will be created using "jit.world" and scaled to 2D.
- We will use Flappy Bird sprites asset available online.
- We will use "jit.gl.videoplane" to project video game background, green pipes and bird.
- We will use "jit.anim" or any other jit library to side scroll the the background as needed.
- We will use key press event mapping to the bird navigation movement.
- We will use the microphone object in Max to get input voice and use buffer to better processing of audio input.
- We will use Buttons and other UI input fields as needed.

4 Background Research

The paper [5] depicts the importance of catered control configurations to create a fair, non-stressful and user-friendly environment for players. The paper [2] has elaborated the effectiveness of frame analytic model of gameplay as a social event that describes how voice interaction enhances or disrupts the Players/User's experience. The paper [8] describes how animation is created using rearranged recorded video frames of a moving object. The paper [4] focuses on creation of sprites based on ranges of different dynamic properties while answering the different limitations like how objects should transition between poses and cannot generalize outside the given drawings. Voice interaction in video games is increasingly explored these days. Voice interaction has depicted certain challenges in achieving the accuracy. Some of the limitations include, the awkwardness that players feel while interacting with the system and inaccurate voice recognition. The paper [1] has researched on common approaches game makers take to address the voice controlled game design challenges. The paper concludes that the recent game developments are overly concerned with speech recognition, and with word recognition accuracy rates in particular, as a perceived barrier to a satisfying player experience. The research on physiological interaction in games [6] proposes a classification of direct and indirect physiological sensor input to augment the traditional game control. There are three major design implications for physiological controlled games : 1) Direct mapping of physiological sensor to reflect action in the virtual world. 2) Indirect mapping provides the best experience to influence features altering the game world. The paper [9] addresses the challenge in building fabrication components to the Mechanics-Dynamics-Aesthetics (MDA) framework. The paper proposes f-MDA framework to analyze the 47 fabrication events from their prior study. The authors have listed new player-object aesthetics that emerge from integrating the existing game mechanics with fabrication mechanics. [3] has explored the Sprite generation using Sprite Fusion, it has investigated different methodologies for sprite generation by taking consideration of what the previous sprite generation have not been covered. [10] it depicts an anticipatory error handling using voice-controlled game where the game would perform in a locally optimized action in respect to goal completion and obstacle avoidance, when a command is not recognized. [7] depicts the evaluation of different control schemes in a 2D game for better understanding of the user experience of the control schemes. Our background research has provided us the insights on current strategies and challenges in game design. We intend to keep the audio control to move the bird around simple, by moving the bird with help of just voice gain/pitch. Our project will not involve the advanced voice recognition technology. Voice Recognition has several challenges as described in [1], and as very few games are available today developed using Visual Programming, our work could showcase the utilization of visual programming in game development.

5 Timeline / Distribution of Work

Tasks	March (15th March To 30th March)	April (1st April To 30th April)	May (Till 6th May)
Max 8 installation and learning OpenGL	(Preeti, Zaman and Rahul)		
Buidling scrolling background	(Preeti)		
Bird movement on key press	(Rahul)		
Collision Detection	(Zaman)		
Integrating all the components and testing		(Preeti, Zaman and Rahul)	
Final Presentation Preparation and Testing			(Preeti, Zaman and Rahul)

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6 Our Research References

6.1 Preeti

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6.2 Rahul

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6.3 Zaman

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