‘Walkies’: An Infinite Runner Game

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Abstract

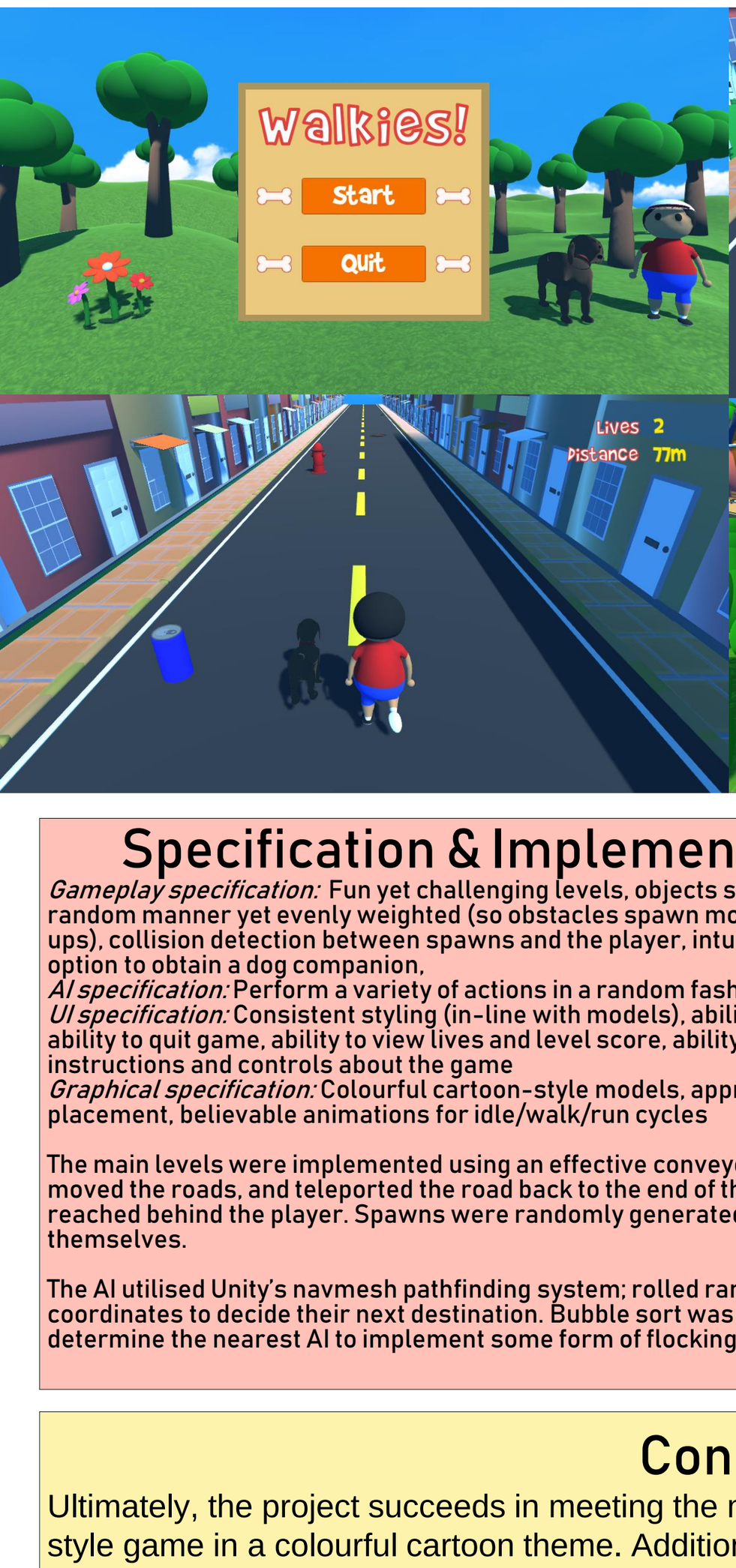
‘Walkies’ is an infinite runner-style 3D video game made using Unity game engine for PC devices. ‘Walkies’ takes place in a quaint suburban town, and features AI agent implementation, alongside a variety of infinite runner-style levels that implement multiple techniques, such as random generation spawning.

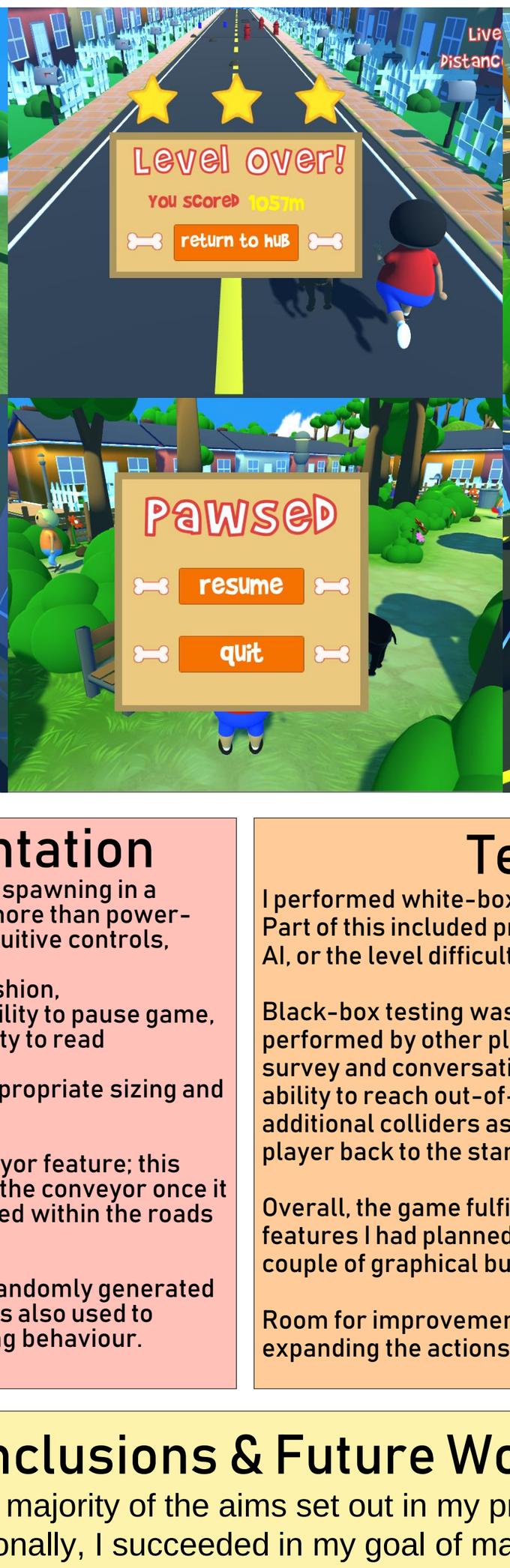
Introduction & Background

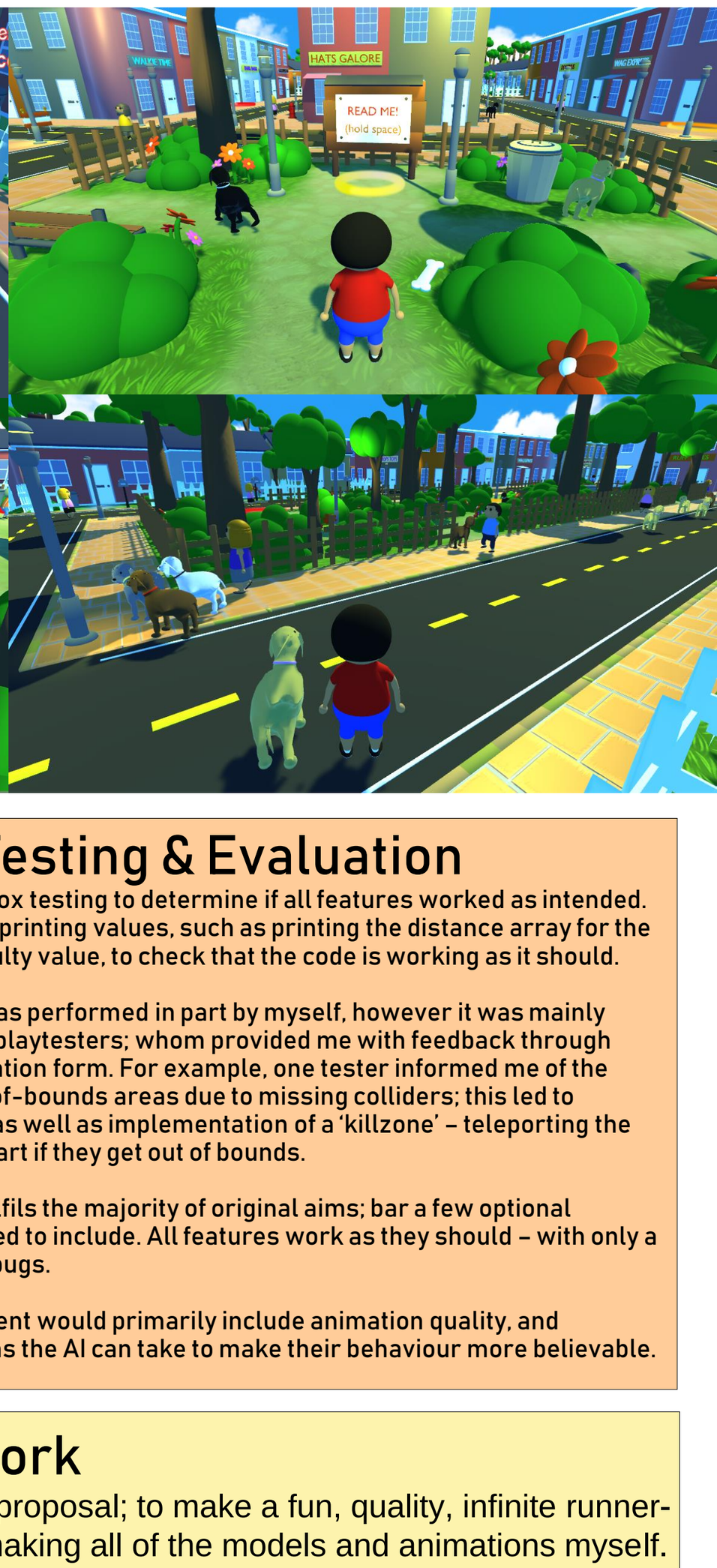
My aim of this project is to develop a 3D game of the infinite runner genre in Unity3D. Alongside the infinite runner aspect of my game, there will be a open hub world, allowing players free roam to do the levels as they wish. Ultimately, I aim to learn at least the basic process of game development, C#, basic AI development, how to animate and model in Blender, and how to use Unity in more depth.

I chose this project as game development contains endless possibilities; allowing developers complete creative freedom to do as they wish, while utilising a variety of different skills – from programming, to modelling, to storytelling.

Creating a video game doesn’t provide a typically obvious ‘problem’ to solve; instead, there are a variety of different problems needed to be overcome to create a successful game, such as: ensuring fun gameplay, originality, game balancing, monetisation, intuitive controls, choosing a successful genre and platform, gripping storytelling, bug-free, and replayability.







Specification & Implementation

Gameplay specification: Fun yet challenging levels, objects spawning in a random manner yet evenly weighted (so obstacles spawn more than power-ups), collision detection between spawns and the player, intuitive controls, option to obtain a dog companion,
AI specification: Perform a variety of actions in a random fashion,
UI specification: Consistent styling (in-line with models), ability to pause game, ability to quit game, ability to view lives and level score, ability to read instructions and controls about the game
Graphical specification: Colourful cartoon-style models, appropriate sizing and placement, believable animations for idle/walk/run cycles

The main levels were implemented using an effective conveyor feature; this moved the roads, and teleported the road back to the end of the conveyor once it reached behind the player. Spawns were randomly generated within the roads themselves.

The AI utilised Unity’s navmesh pathfinding system; rolled randomly generated coordinates to decide their next destination. Bubble sort was also used to determine the nearest AI to implement some form of flocking behaviour.

Testing & Evaluation

I performed white-box testing to determine if all features worked as intended. Part of this included printing values, such as printing the distance array for the AI, or the level difficulty value, to check that the code is working as it should.

Black-box testing was performed in part by myself, however it was mainly performed by other playtesters; whom provided me with feedback through survey and conversation form. For example, one tester informed me of the ability to reach out-of-bounds areas due to missing colliders; this led to additional colliders as well as implementation of a ‘killzone’ – teleporting the player back to the start if they get out of bounds.

Overall, the game fulfils the majority of original aims; bar a few optional features I had planned to include. All features work as they should – with only a couple of graphical bugs.

Room for improvement would primarily include animation quality, and expanding the actions the AI can take to make their behaviour more believable.

Conclusions & Future Work

Ultimately, the project succeeds in meeting the majority of the aims set out in my proposal; to make a fun, quality, infinite runner-style game in a colourful cartoon theme. Additionally, I succeeded in my goal of making all of the models and animations myself. Thus, I feel my project was successful overall despite missing a few planned features – such as saving and high scores.

Future work would include implementing the missed out features, as well as other possible expansion features, such as a backstory, reward store to spend stars, day/night cycle, and interaction with the AI.