BLADE RUNNER

CS6026 - GAME DEVELOPMENT PROJECT WORK

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TABLE OF CONTENTS

Game Overview:

Game Philosophy:

Envisioned with the core belief that gaming should be universally enjoyable, "Blade Runner" strives to create an immersive and accessible experience. Our aim is to seamlessly blend entertainment with simplicity, providing players of all ages with a captivating and lighthearted journey.

Game Concept:

I. Core Gameplay:

In "Blade Runner," players navigate a whimsical space adventure as a frog donned in human attire. The gameplay intricately combines elements of an infinite runner, requiring precise jumps, strategic shooting, and swift decision-making to overcome dynamically generated challenges.

II. Visuals:

The visual aesthetics of "Blade Runner" are carefully curated to evoke a sense of wonder and joy. The character design, featuring a frog in a human suit, injects humor into the gameplay. The overall visual narrative is a vibrant and colorful tapestry, immersing players in a visually stimulating universe.

III. Controls:

Designed for ease of use, the control scheme is intuitive. The left button governs shooting, while the right facilitates jumps. The focus is on providing players with a seamless and responsive interface to enhance the overall gaming experience.

IV. Scoring:

The scoring mechanism in "Blade Runner" is multifaceted, encompassing distance covered and the acquisition of collectibles. Health management adds an additional layer of strategy, with falling off platforms imposing penalties, while collectible hearts serve as health replenishers.

V. AI:

Artificial intelligence takes center stage with mischievous robots as formidable adversaries. The game dynamically adjusts the AI challenge level, ensuring an engaging experience for both novice and experienced players.

Target Audience:

"Blade Runner" has been meticulously crafted to appeal to a diverse audience. With a focus on families, casual gamers, and children, the game is designed to transcend age barriers. The charming characters, combined with straightforward mechanics, create an inclusive gaming experience that welcomes players of all backgrounds.

Genre:

Situated within the "Adventurous Infinite Runner" genre, "Blade Runner" offers a harmonious blend of platforming and shooting elements. The game's design ethos aligns seamlessly with the accessible nature of the genre, ensuring an engaging and approachable adventure. "Blade Runner" beckons both seasoned gamers and those new to the genre, promising an immersive experience that transcends traditional gaming boundaries.

Game Features:

I. Game Menu:

- Customize your experience through options like sound controls.
- Initiate the game with the play button for a seamless transition into the adventure.

II. Gameplay:

- The character autonomously traverses dynamically generated platforms.
- Player-controlled actions of jumping and shooting add layers of strategy to the experience.

III. Scoring and Health:

- Accumulate points based on distance and collectibles.
- Health management becomes crucial, with falling impacting health and collectible hearts providing recovery.

IV. AI Challenges:

- Encounter AI-driven robots that introduce strategic challenges.
- Dynamic AI adjustments ensure a tailored experience for players of varying skill levels.

V. Collectibles:

- Collectible hearts serve as strategic assets, offering health boosts with calculated rarity.

VI. Game Over:

- Post-fall, experience a controlled setback with an opportunity for recovery.
- View and reflect on your score and achievements before embarking on subsequent attempts.

Gameplay Overview:

Game Mechanics:

"Blade Runner" immerses players in an engaging gameplay experience that seamlessly integrates several key mechanics to deliver a dynamic and entertaining adventure.

I. Autonomous Running:

The protagonist, a frog in human guise, embarks on an endless journey across dynamically generated platforms in space. The autonomous running feature eliminates the need for manual propulsion, allowing players to focus on strategic actions.

II. Player Controls:

Intuitive controls enhance the player's agency within the game. The left control is dedicated to shooting, while the right facilitates jumps. This configuration offers a balanced interface, allowing for precision in both offensive and defensive maneuvers.

Objective:

Endless Adventure:

The primary objective is to navigate the frog through an endless series of platforms, obstacles, and challenges. As players progress, the complexity of the environment increases, requiring a combination of strategic shooting, precise jumps, and quick reflexes to overcome obstacles and adversaries.

Game Flow:

I. Dynamic Procedural Generation:

"Blade Runner" employs dynamic procedural generation to create a diverse and ever-evolving gaming environment. This technology ensures that each run is a unique experience, presenting new challenges and opportunities. The procedural generation algorithm takes into account player performance, adapting the difficulty level accordingly.

II. Incorporation of AI Challenges:

The game introduces AI-controlled robots strategically placed on platforms. These robots serve as adversaries, shooting at the player. The frequency and difficulty of these encounters dynamically adjust based on player skill, maintaining a fine balance between challenge and enjoyment.

III. Scoring and Health Management:

Players accumulate points based on the distance covered and the collection of hearts. Health management becomes crucial as falling off platforms deducts health, and players can strategically recover by collecting rare hearts.

Level Structure:

I. Progressive Difficulty:

The game follows a progressive difficulty curve, introducing players to fundamental mechanics before gradually escalating the challenges. As players master the basics, the introduction of more complex platform layouts, increased robot density, and altered environmental conditions keep the experience fresh and engaging.

II. Collectibles and Rewards:

In addition to the overarching objective of distance covered, the inclusion of collectibles such as hearts introduces a layer of strategy. These collectibles not only serve as health boosts but also contribute to the overall score, rewarding players for skilled gameplay.

III. Immersive Feedback:

Immersive feedback is provided through visual and auditory cues. Aesthetic elements, such as vibrant visuals and playful character animations, enhance the gaming experience. Additionally, sound effects and dynamic music adapt to the on-screen action, contributing to a responsive and engaging atmosphere.

IV. Progression and Achievements:

Players are incentivized to explore various aspects of the game through an achievement system. Successfully executing complex maneuvers, achieving high scores, and reaching specific milestones unlock achievements, providing a sense of accomplishment and encouraging continued exploration of the game's mechanics.

Game Mechanics:

1. Game Universe:

Immersive Nocturnal Landscape:

"Blade Runner" unfolds within the captivating embrace of a nocturnal cityscape. The dark blue skies are punctuated by towering buildings that cast long shadows across the urban landscape. The cosmic void gives way to a serene yet dynamic setting, with the city's silhouette serving as the backdrop for our frog protagonist's endless journey. The transition from day to night creates a distinct atmosphere, infusing the game with a sense of mystery and wonder against the canvas of the city's nocturnal beauty. This game world and characters are implemented using the Unity game engine.

2. Rules - Explicit and Implicit:

Explicit Rules:

- Players embark on a journey navigating the frog character through the urban night.
- Survival hinges on strategic shooting to dispatch robots and monsters.
- The collection of hearts not only fortifies the player's health but contributes significantly to their overall score.

Implicit Rules:

- Spatial awareness becomes a critical skill, as players must master the art of gauging distances and timings for precisely executed jumps.
- The inherent forward momentum emphasizes the perpetual nature of the endless runner genre, encouraging continuous engagement and responsiveness.
- The game subtly encourages a dynamic interplay between experimentation and skill refinement as players progress through the shifting cityscape.

3. Physics:

Gravity and Realism:

The dynamic platform movement is governed by the force of gravity, which imparts a sense of realism to the game environment. As the frog character navigates across platforms, the effects of gravity are subtly simulated, influencing the trajectory and timing of jumps. This integration of gravity contributes to a more immersive gaming experience, where the sensation of weight and motion aligns with real-world physics.

Bullet (Colored Ball) Dynamics:

The bullets, represented as colored balls, exhibit realistic projectile motion. Each shot follows a trajectory influenced by factors such as initial velocity and gravity. This adherence to projectile motion principles adds an element of skill and strategy to shooting, requiring players to account for both distance and the movement of adversaries.

Collision and Impact:

Upon firing, bullets interact dynamically with the game environment. The collision detection system ensures accurate impact, whether it be hitting a robot or colliding with a platform. The physics governing these interactions contribute to a visually coherent and responsive experience, enhancing the overall satisfaction of successfully eliminating adversaries.

Dynamic Platform Interaction:

The act of running on platforms is intricately tied to the physics engine, creating a seamless interaction between the frog character and the urban landscape. The physics engine governs the friction, velocity, and response to changes in direction, providing players with a responsive and intuitive platform-running experience.

Platform Stability:

Platforms respond dynamically to the frog's presence. Stability is affected by the frog's position, creating a sense of realism as the character shifts its weight during movements. This nuanced platform stability contributes to the overall challenge and engagement as players navigate the multi-leveled cityscape.

Falling Down Due to Gravity:

Gravity plays a pivotal role in the game's physics, especially when the frog character falls. The descent is modeled to mimic realistic free-fall, creating a sensation of weight and acceleration. The physics engine ensures that the fall is influenced by factors such as initial velocity, height, and the constant force of gravity.

Impact and Respawn:

Upon falling off a platform, the collision system accurately registers the impact, resulting in a visually satisfying display of particle effects. The respawn mechanic, triggered by falling, integrates seamlessly with the physics engine, providing players with a controlled setback. The physics of the fall and subsequent respawn align with the overall goal of maintaining a fair and immersive gameplay experience.

Robot Interaction:

When bullets interact with robots, the physics engine governs the trajectory and impact dynamics. The responsiveness of robots to being hit, coupled with their reaction animations, adds a layer of realism. The combination of projectile motion, collision detection, and dynamic responses contributes to a visually coherent and engaging combat experience.

4. Animation:

Character Animation:

The frog character's animations serve as a narrative conduit, infusing playfulness into the game. Expressive animations respond to in-game events, creating a character with a personality that resonates with players. Smooth transitions between actions maintain visual continuity, enhancing the immersive experience amid the city's nocturnal charm.

Environmental Animations:

Within the urban night, dynamic elements include the subtle interplay of shadows cast by towering buildings, occasional glimmers of distant city lights, and the faint hum of nocturnal life. These environmental animations contribute to the visual richness, creating a captivating and dynamic cityscape.

5. Collision:

A meticulously designed collision system ensures the accuracy of interactions within the game. The system registers collisions between the frog character and platforms, collectibles, and adversaries with precision. This level of detail in collision detection is essential for maintaining the game's responsiveness, fairness, and overall immersion within the urban night.

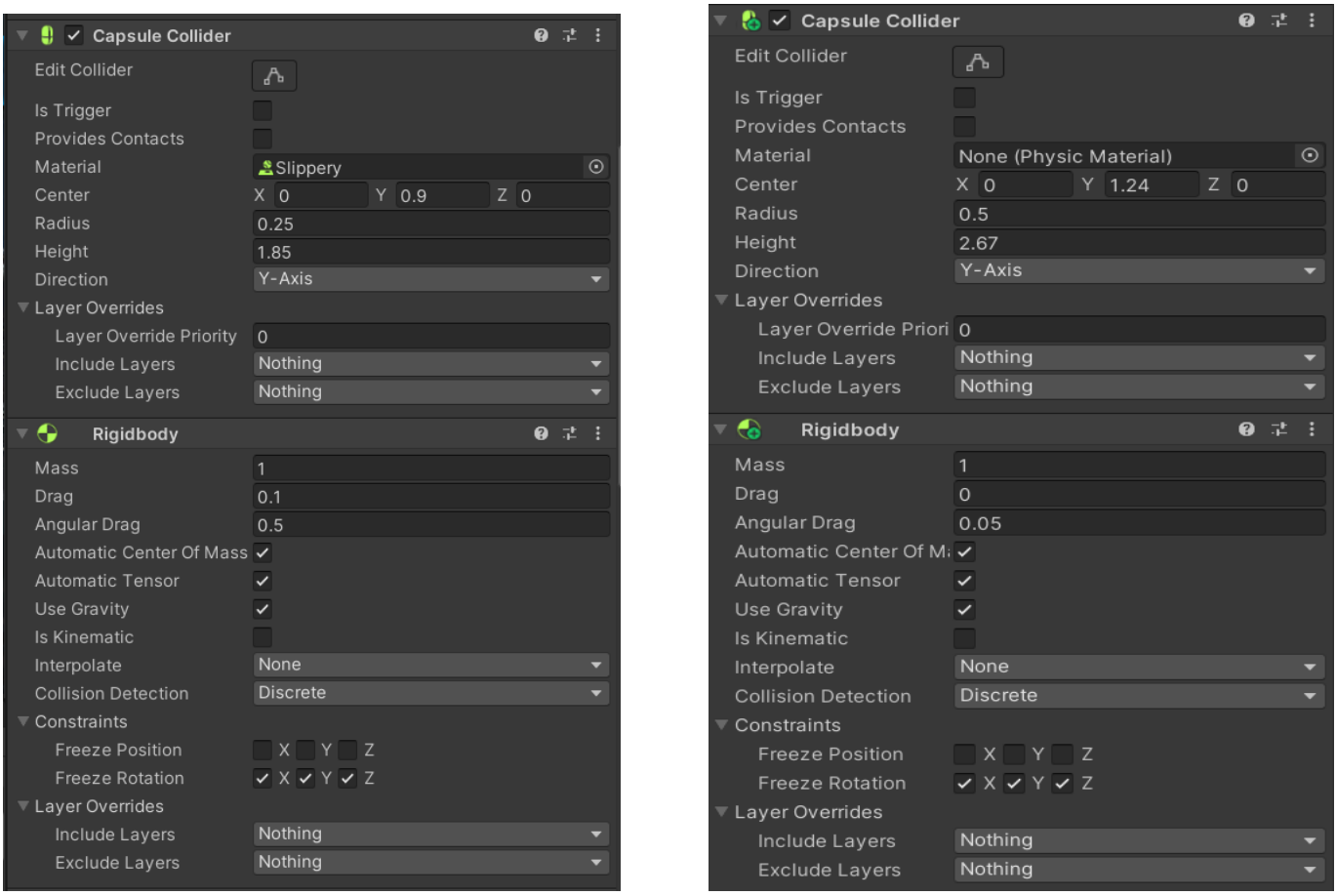


Fig. 1. Colliders and Rigidbody for Player & Robot

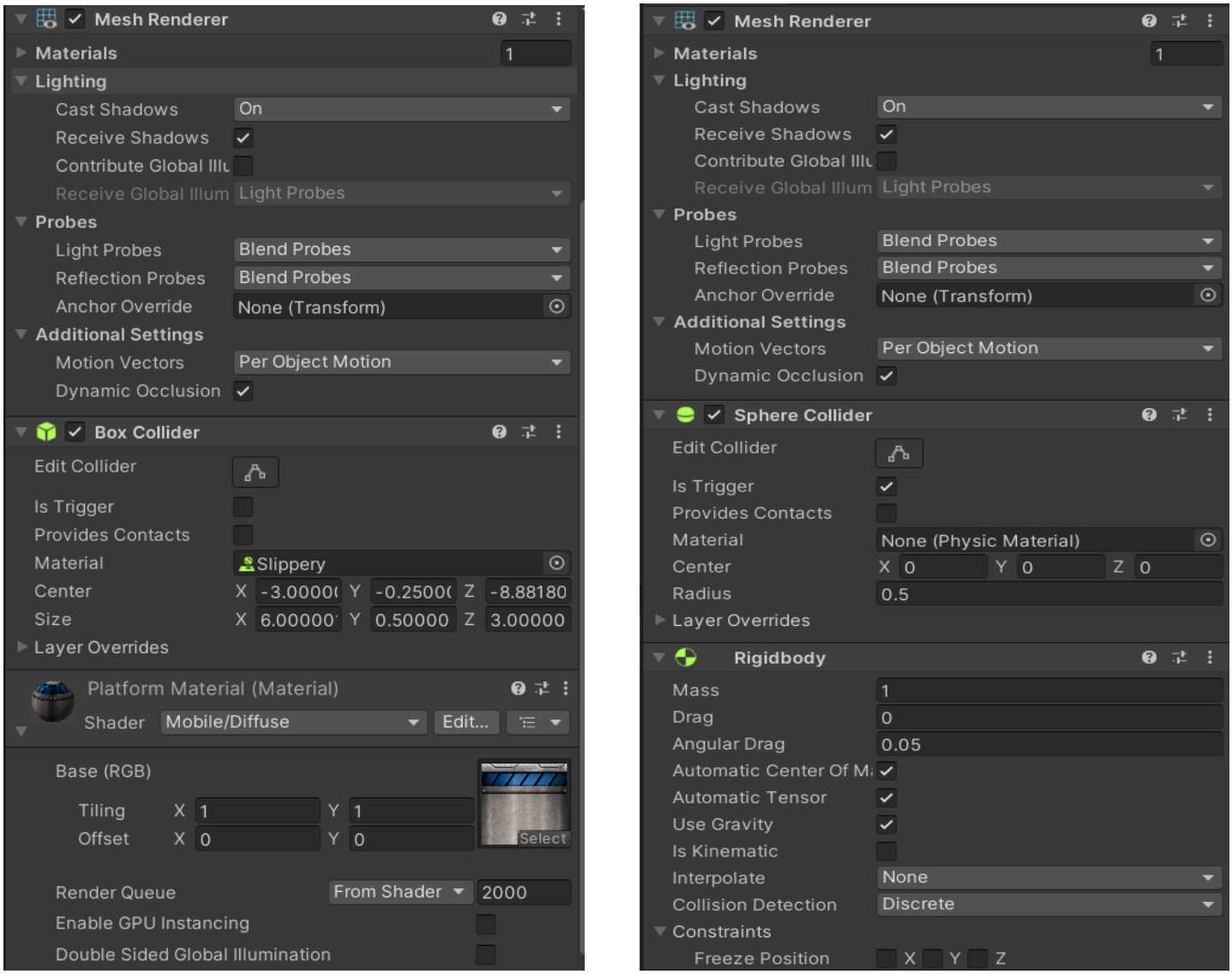


Fig. 2. Colliders & Rigidbody for platforms & bullets

6. Objects:

Platforms:

At the core of the game environment, platforms manifest in diverse forms within the urban night. They serve as the primary stage for the frog's journey, navigating the multi-leveled cityscape against the backdrop of buildings and shadows.

Robots and Monsters:

Adversarial entities, these creatures are equipped with shooting capabilities, adding an engaging layer of challenge. Encounters with robots and monsters

prompt players to strategically employ shooting or risk health deductions, creating dynamic moments within the nocturnal cityscape.

Collectibles (Hearts):
Strategically placed amidst the urban night, collectible hearts serve a dual purpose. They contribute significantly to the player's score and provide essential health boosts, creating a dynamic incentive for players to navigate the cityscape with a delicate balance of offense and defense.

7. Actions:

Jumping:
The jump action becomes a strategic maneuver for players, serving as the key to navigating platforms, circumventing hazards, and exploring the multi-leveled cityscape under the dark blue skies.

Shooting:
Empowering the frog character, the shooting action is instrumental in overcoming challenges presented by robots and monsters. Successful shots not only contribute to the player's score but ensure the survival of our amphibious protagonist amid the urban night's trials.

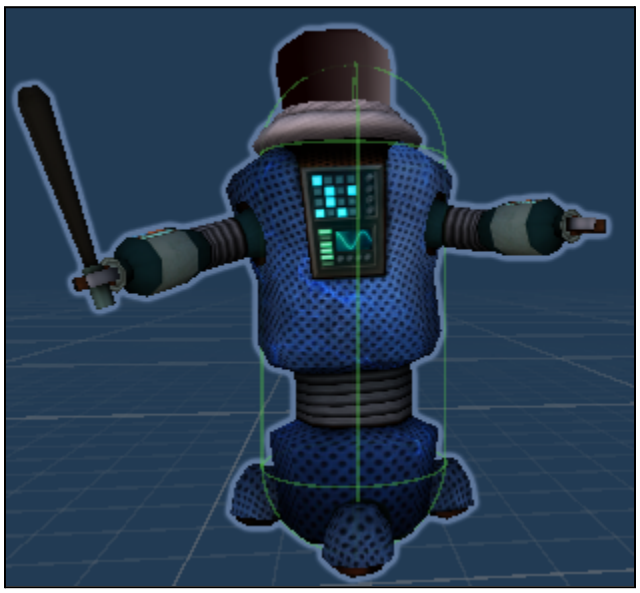
8. Economy:

Scoring Economy:
The scoring system serves as the primary economic driver within the game. Players are incentivized to explore various aspects of the urban night, achieving milestones and unlocking achievements that contribute to their overall progression through the nocturnal cityscape.

Health Economy:
Health emerges as a valuable resource, influencing the dynamic economy of the game. The strategic collection of hearts becomes a nuanced aspect of managing resources, allowing players to extend their journey through the cityscape and delve deeper into the mysteries of the urban night.

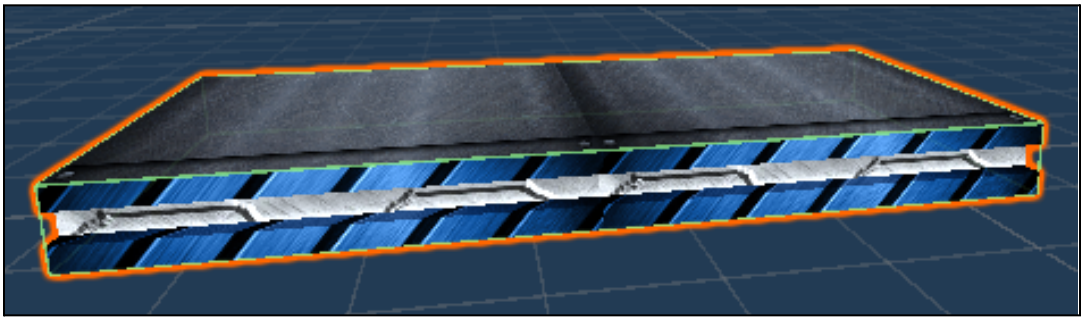
Game Objects:

Player & bullets



Robot

Health Collectible



Platform

Implementation:

Fig. 3. Main Menu with game settings

Fig. 4. Game World and start of the game

Fig. 5. Game Paused & Panel with resume, replay controls

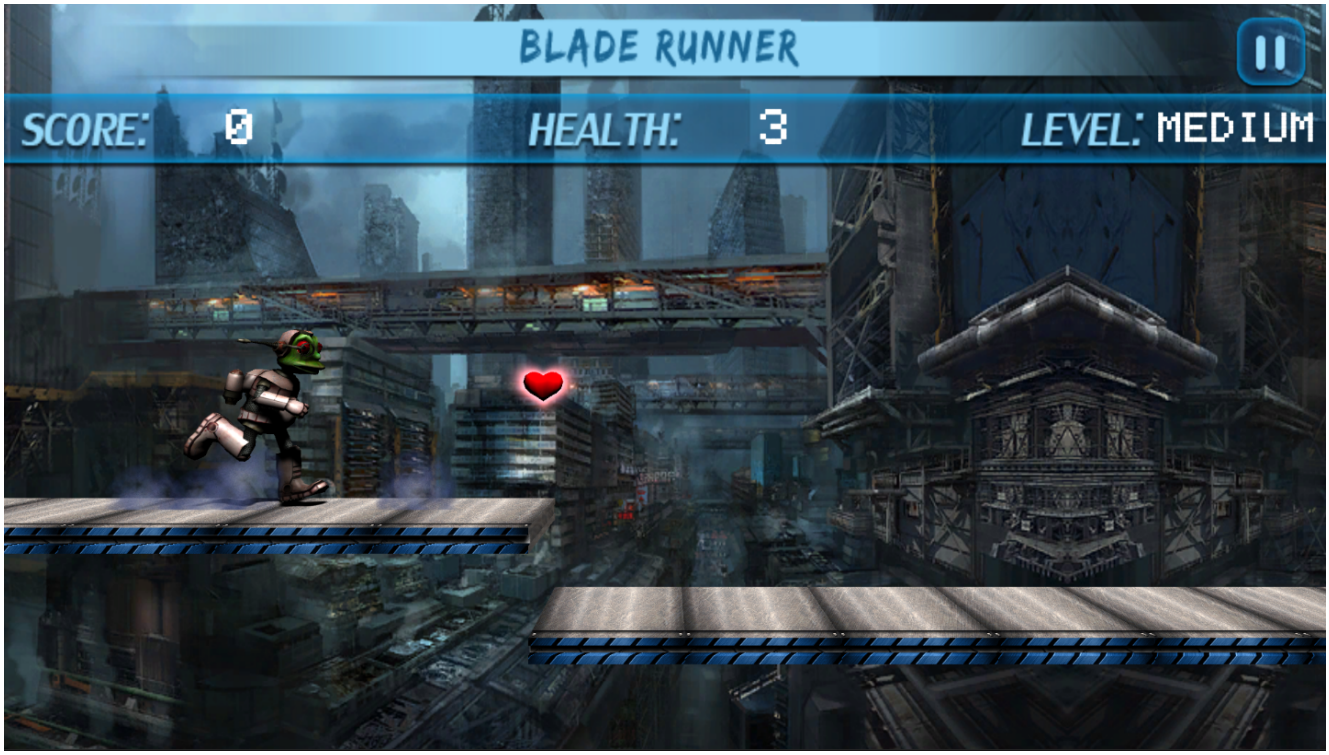


Fig. 6. Health collectible & player foot smoke particle effect

Fig. 7. Robots acting as obstacle & have shooting abilities

Fig. 8. Player shooting bullet to counter attack robots

Fig. 9. Death smoke effect after destroying robot

References:

- Learn Game development - Unity
- Unity Documentation
- Learn Unity - Beginner's Game Development Tutorial