

Game Development - Bounty Rescuestep

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Abstract - Now a day everyone is having a passion of playing Survival games so, keeping on mind this project gives a best experience on playing the best escaping game. Usually this game consists of very high visual graphics. Ball is the main player in the game designed, the main aim of the player is to hold its life and reach from source to destination by escaping from the different disturbances like obstacle which come in between. Game has many modules mainly Ball control, Checkpoints, Enemy kill and die, Self-destruct, Coin pickup and many other modules. Game has made for all devices like, windows and Mac OS systems. This Game is made by Unity Platform, and programming is with Javascript. Entire game gives a good experience with good Visual Effects.

Keywords: Survival games, Escaping game, Javascript, Visual Effects.

I. INTRODUCTION

Bounty Rescuestep is game which gives the more challenging levels than the other survival game in the world. The game is about the ball surviving from the different types of obstacles in the 2 levels of the game using life expectancy. Bounty Rescuestep gives a gives a best visual design, simple controls and best comprehension of the development of 3D objects in the game. It provides high difficulty in playing with the obstacles and escaping from them. It gives high trouble in playing with the obstacles and getting away from them.

Bounty Rescuestep is created by a gaming platform called "Unity 3d 5" and animation of gaming objects like Ball Destroy, Smoke effect and Ball pieces are done with the animation software called "Blender 2.0". The programming is done to the objects like Ball Movement, Ball Kill, Coin Pickup and Enemy Kill are done with the Programming language "Java Script (js)". 3D modeling, Rendering of the objects and physics applied on the objects are done with the use of Unity.

Bounty Rescuestep is made for the different platforms like Windows, Linux and Mac PCs. Controls are made only for PCs which has a keyboard because, all controls are programmed for only keys pressed for arrow keys and space. By starting the game asks frequently for the setting like Resolution, Full screen or windowed, Graphics quality. If these settings are done then game starts.

II. SURVEY

Motivation: Maximum of people are spending their time in playing games in free time and that too a survival games have got a huge popularity and I am from those people who plays a lot of survival games. Got an interest to create a game like a survival game to increase design and creativity skills in me and give a challenging game to world. Aim the addiction of people on the game.

Scope: Gaming is a passion in every person's life. Not only in designing a game, but also playing games will gain some ideas and creativity in the person. More Challenging levels and difficulty will increases the anxiety in the person's mind to play the game more.

Objective: Bounty Rescuestep is a game of huge escaping techniques and having the challenging levels in it. Its main objective is to reach the destination using the life span of a ball. Bounty Rescuestep aims the people who are addicted to the survival games and gives full satisfaction and makes people to addict to this game.

Problem Definitions: Problem in the existing system is failed to give a good visual graphics and challenging levels. The existing system Nokia Bounce game has these problems and light weighted obstacles are the main drawback of the game. These problems are analyzed and we have given a possible outcome to the problems defined.

Existing System: Nokia Bounce game is a classic game and got popular in 2009. Its Gameplay is about to survive a ball from different obstacles like water, lamp and rings. In the part of gameplay there will be power up ring to make ball bigger. Gameplay will be exceptionally appealing and the levels will be anything but difficult to play. It is a 2D game so the visual graphics will be in medium and the sprite's pixels also will be visible because of low visual graphics. Bounce game was very much popular because, it was the attractive game in those days in the Nokia mobile phone. After the completion of J2ME mobile generation the new technology Android has launched many games in 3D and also in 2D. There are many different levels to survive in the game and keep alive till it reaches the destination. There were many obstacles like spiders, sharps and fire. If the ball hits to these obstacles then the ball loose its health and then restarts the game from the checkpoint which was reached last In these last 7 years the developer of Bounce

game was kept silent by leaving it with all the bugs but, people can't forget the game and its popularity. Keeping that on mind this project is started with the more advanced features and high visual graphics.

Disadvantages of Existing System: Nokia Bounce game has many disadvantages as it was developed many years ago. Now new technologies have been developed to solve those disadvantages and give a adventurous game to the users. The main disadvantages of the Nokia Bounce game are:

- Bounce game has very less difficulty levels to survive and very easy to play the game and complete it.
- Bounce game has very less visual graphics and designed with old technology 2D.
- Obstacles are not exceedingly perilous to survive and we can't kill them in the gameplay.

Pixel clarity in the diversion will less and every one of the items in the game is not obviously outlined.

III. DESIGN

Systems design is the way toward characterizing the design, segments, modules, interfaces, and information for a systems design to fulfill determined prerequisites. Systems design could be viewed as the utilization of systems design hypothesis to item advancement. There is some cover with the controls of frameworks examination, design and frameworks building.

3.1 System Proposed

Bounty Rescuestep is a game which is designed with the 3D technology with high visual graphics and challenging levels. Diversion will need to trouble levels however numerous checkpoints scattered amidst the levels. Checkpoints are utilized to restart the diversion from the closest indicate abstain from beginning from the earliest starting point.

Bounty Rescuestep has designed with 3D animated enemies and Obstacles. Enemies are scatters in the game at every step to be made more challenging for player. Obstacles are outlined in a manner that, ball can't escape from those hindrances effortlessly. Many obstacles designed like Hammers, Fire Balls, Lamps, Sharps, rockets and other unusual obstacles in the game.

Unusual obstacles are like, when the ball is going on unexpectedly the way will be destroyed and ball will fell down and the game starts again. Furthermore, the ball will move and all of a sudden at a specific place a colossal divider will fall on the ball and ball will be devastated. At last, a circumstance happens where ball will be encompassed by numerous obstructions and around then an undetectable collider will detect the ball and opens an approach to escape from that circumstance. Ball Destroy effect is designed in the software called "Blender". When a ball hits to an enemy or obstacle then the ball break in to the pieces. Whenever any fire obstacles like Fire Ball or Rocket hits the ball then the ball will be blasted and breaks in to pieces and the smoke effect will be instantiated. After escaping from all these obstacles the ball reaches a destination where at end a rocket launcher will be

present. The ball must destroy the Rocket launcher and reach the home to enter in to next level or to complete the game.

Advantages of Proposed System: Bounty Rescuestep has many advantages as it was developed by new platform Unity 3D 5. New technologies has been developed many advances in making a game to gain more users and reputation.

The primary favorable circumstances of the Bounty Rescuestep game are:

- Bounce Rescuestep has high difficulty levels to survive and very hard and challenging to play the game and complete it.
- Bounty Rescuestep game has very high visual graphics and designed with new technology 3D.
- Obstacles are profoundly risky to survive and we can even kill them in the gameplay however not every one of the obstacles.
- Pixel clarity in the game is great and execution and speed exceptionally productive and can change the design and determination settings before the gameplay.
- Challenging levels in the game makes very addicted to the players. Animations are with very high visuals than the existing system.

3.2 System Architecture

System architecture is the calculated model that characterizes the structure, conduct, and more perspectives of a system. A design description is a formal portrayal and representation of a system, sorted out in a way that backings thinking about the structures and practices of the system.

Entity Component System (ECS) is an architectural pattern that is mostly used in game development. An ECS follows the Composition over inheritance principle that allows greater flexibility in defining entities where every object in a game's scene is an entity (e.g. enemies, bullets, vehicles, etc.). Every Entity consists of one or more components which add additional behavior or functionality. Therefore the behavior of an entity can be changed at runtime by adding or removing components. This eliminates the ambiguity problems of deep and wide inheritance hierarchies that are difficult to understand, maintain and extend. Common ECS approaches are highly compatible and often combined with data oriented design techniques.

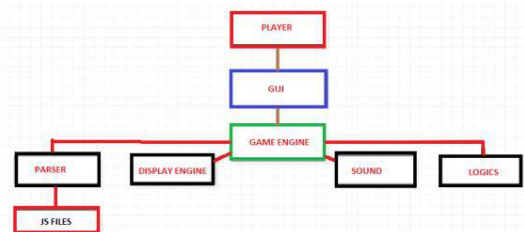


Figure 1. Architecture of the system.

3.3 Modules

Bounty Rescuestep is a purely dependent on the modules. All the modules are created by the language JavaScript. There are many modules in the game for every action for which the player has made.

The main modules in the game which are frequently used as follows:

- **Ball Control:** Ball control is utilized to take the input from keypad and execute as indicated by the code written in it. At the point when a player types horizontal arrow keys then the ball pushes ahead and in reverse and space is utilized to bounce. Numerous other controlling rationales have been utilized.
- **Ball Health:** Ball health is used to destroy the Ball object and instantiate the breaking effect and restart the game from check point or from the beginning of the game. It also used to produce ball blast effect.
- **Kill Script:** Kill Script is used whenever the ball hits to an obstacle then this module redirect to the Ball health and then the ball object will be destroyed. It has a function "OnTriggerEnter()" which takes any action when an object enters the collider.
- **Coin Pickup:** Coin Pickup is used whenever the ball collects the coins. The Script consists of Trigger function. When the ball touches the collider then trigger activates and the following logic will execute such that the coin gets invisible by providing coin effect and increments the score by 1.
- **Die On Hit:** Die on hit is a script used when a player kills the enemy by bouncing on the top collider of the enemy then the enemy dies with the animated object and then followed by destroy() function to destroy the Enemy center objects.
- **Check Points:** Check Point Script attached to the invisible collider when a ball reaches this check point then the module activates and store the position of x, y and z axes and start the game from the last check point.

IV. IMPLEMENTATION

Animated Enemy Flow Diagrams: In the game Enemy is animated from initial state to different states and flow of states are given as shown in fig 2.

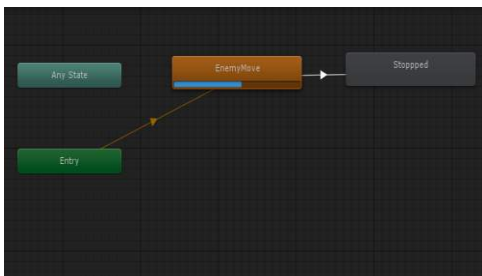


Figure 2. This flowchart represents the state when an enemy is in Moving State.

Fig 2 shows that, the blue bar represents enemy is in Moving state. Till an enemy occurs any action it loops in the same state.

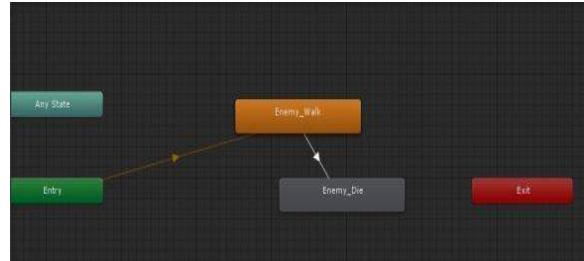


Figure 3. Enemy walk state and Enemy Die state.

Fig 3 shows 2 more states where enemy can Walk, Die and Exit. Whenever a game starts the enemy goes to "Enemy_Walk" state, if player kills the enemy then enemy goes to "Enemy_Die" State and then followed by "Exit" state to destroy the Enemy object.

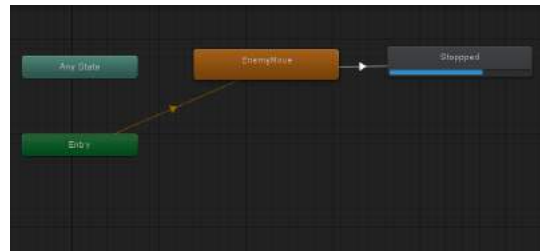


Figure 4. Enemy goes in to Stopped State.

Fig 4 shows that, the blue bar represents enemy is in Stopped state. It means that Enemy is killed and object is also destroyed.

Transformations: In the game there are many Transformations like Rotations and Positions. Objects like Coins, Enemy, Fireball and Hammers will having some actions to move horizontal and vertical. These Transformations are done as shown in below figures.

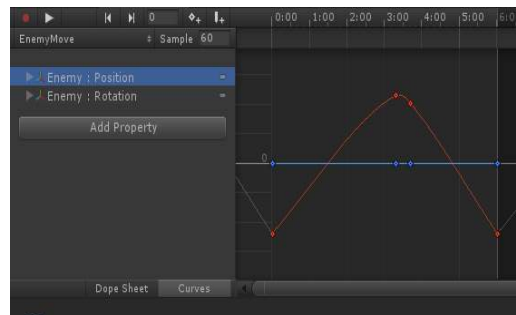


Figure 5. Change in enemy Position to move horizontal.

Fig 5 shows the position of coin within 6 seconds at 180 degrees in the Y-axis direction and add a loop to move horizontal continuously till it killed by the player.

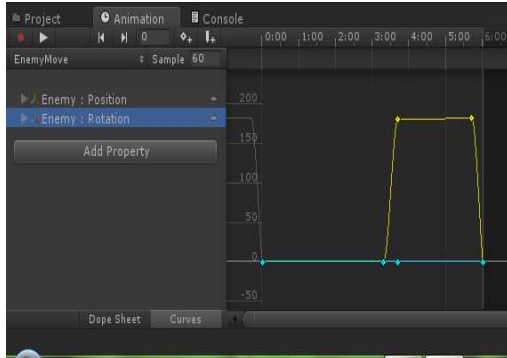


Figure 6. Graph representation of both position and rotation.

Fig 6 shows the revolution and position in a diagram representation of a foe inside 6 seconds at 180 degrees in the Y-axis bearing and add a loop to Transform. “Blue” line represents “Rotation” and “Yellow” line

V. RESULT

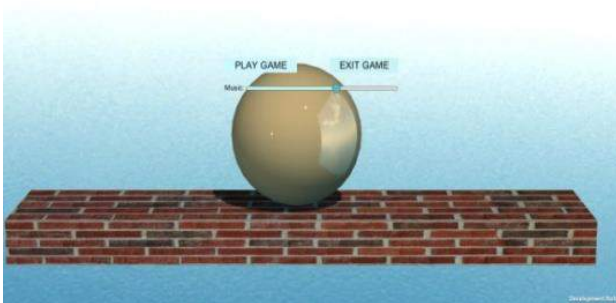


Figure 7. Main menu screen to start the game or exit.

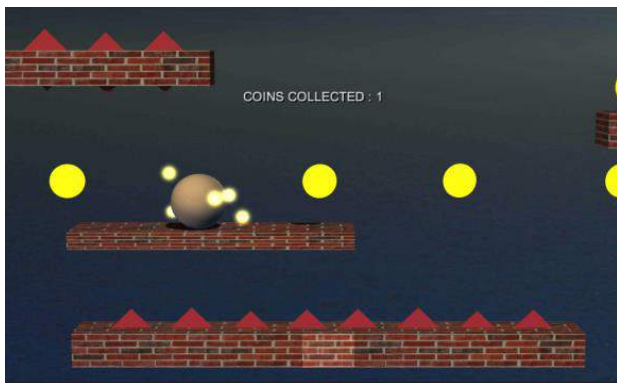


Figure 8. Ball effect when a coin is picked.

Fig 8 describes the effect which is instantiated when a ball collects the coins. The effect is called as a coin effect. Whenever the coin is picked, coin will disappear by producing this effect and the scorecard will increase by 1.

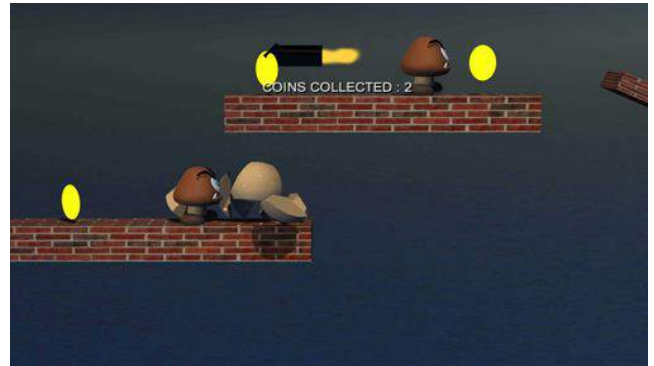


Figure 9. Ball destroy effect when a ball is hit to enemy.

Fig 9 describes, when a ball touches or hits to the enemy then ball will break in to pieces and player loses 1 life and again game will be restarted.

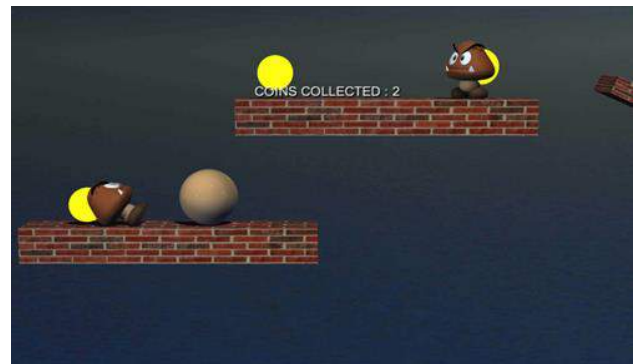


Figure 10. Effect when Ball kills an enemy.

Fig 10 describes when an enemy is killed by the ball. At whatever point a ball bounced on the highest point of the foe then an adversary will be killed as shown in the above figure.



Figure 11. Smoke effect when a ball gets blast.

Fig 11 describes a blasting effect, when a rocket or any fire obstacle hits the ball then smoke effect is produced as shown.

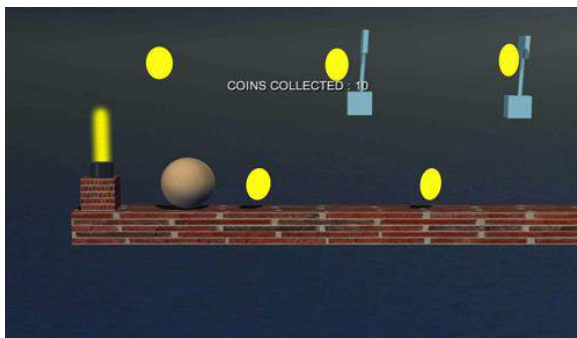


Figure 12. Light Obstacle and Hammer Objects.

Fig 12 describes 2 new obstacles called Light Obstacle and Blue color objects are called as Hammers. Even these obstacles are also can ruin the life of the player “Ball”.



Figure 13. Ball Burning Effect when a fire ball touches the Player.

Fig 13 describes a burning effect, when a fire ball obstacle hits the ball then smoke effect is produced and breaks in to pieces as shown.

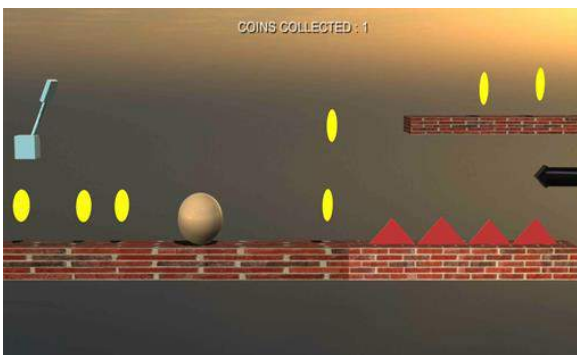


Figure 14. Clear image of Sharp of Sharp Obstacle.

Fig 14 describes a new obstacle called Sharps. Even the ball jumps or bounce on these sharps then the ball will break in to pieces and game will be restarted. The Sharps are customized to move vertically.



Figure 15. Final Destination called as Home.

Fig 15 describes Home, where a ball should reach final destination to start the new level or end the game.

VI. TEST CASES

User Interface: User Interface Test case is used to check that gameplay display is working under following conditions.

- Check that Full screen mode is working or not.
- Check that will the game supports all the screen resolutions are not.
- Check the graphic settings to work efficiently.
- Check for animatronics, movements of the objects, Computer graphics, all gestures like Zooming etc.
- Objects overlapping
- Character should move from specific area or screen.

Performance: Performance is measured in different conditions like the game loading speed, the total memory occupied by the game and also elapsed time of the game.

- Check the stacking time of the diversion.
- Make beyond any doubt that any move is not making impressive time; the flow in the game should be fast enough throughout the levels.

Score: Score Test case is used to check the scoring module and its functionality in the game.

- Score estimation to be measured.
- Need to monitor the levels played with the score.
- Score board to be observed.

Functionality: Functionality test case is used to check the working of logic and object in the game to work properly.

- Check diversion range , Check amusement rationale, Play till last level, Check for the reward score, Check the score climb when the level gets expanded, Menu alternatives, Different diversion modes and area, Check for the time-out.

VII. CONCLUSION

Our video game known as Bounty Rescuestep worked really well. It is now performing all the features that we aimed for. Now user can escape different obstacles using the player Ball. There are many levels of difficulties. We can easily change reach the destination to get through the next level.

We are getting two hundred and fifty five vibrant colours for each pixel. The limited size of the memory that is SRAM limited our design to 8 bits per pixel but still it full fills our requirement. We could get more colourful picture if we have an access to large memory.

Toward beginning of the game we planned to include more components in the diversion that is to make it for android and other cell phones. Encourage we expected to make an immaculate 3D diversion. Be that as it may, the plan of the amusement turned out to be excessively mind boggling than anticipated. It required us a great deal of investment to compose that rationale. Hence we are including these components as future upgrades.

We took in a considerable measure through this game. This project has honed our idea of VGA controller and the software-hardware interface. We took in a great deal about various memory interfaces. This project involved almost all kinds of memories that are SRAM, RAM, ROM and SDRAM. This project not only tested our technical skills but also our temperament. There were times that we practically lost trust yet we recouped through consistent focus and diligent work.

VIII. FUTURE ENHANCEMENTS

Make the game more attracted with the new difficulty levels and challenging to the user to feel more addicted to the game. Another future enhancement can be made is that game is available in android platform.

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AUTHOR PROFILE

Prasad B., currently working as Associate Professor in department of Computer Science and Engineering from Marri Laxman Reddy Institute of Technology & Management (MLRITM) JNTU-H, Hyderabad. Prior to coming to MLRITM worked as Assistant Professor in various universities (Lovely Professional University, JNTU-H and Pondicherry University) and have total 10.5 Years of Teaching Experience. Pursuing PhD in Content Based Image Reterival through Clustering from Gauhati University, Guwahati. Received Masters Degree (M.Tech) in Distributed Computing Systems. from Pondicherry University. Received Bachelor's Degree (B.Tech) in Computer Science and Engineering from Kakatiya University. Research areas include Data Mining, Image processing and Cryptography. Member of IAENG, IFERP, ACM, CSI, IEEE. Supervised many UG and PG projects and present guiding one DST Project. Published several papers in international and national journals and conferences. Attended various FDP, workshops. Currently working on Multi-Modal Biometric Template Security: Fingerprint and Palmprint Based Fuzzy Vault including Human Face, Eye – Iris. And also on Content-Based Image Retrieval through Clustering.



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