
PROJECT: NOCTURNE

Intent Statement

“By using rhythm-based mechanics that require players to hit notes scrolling along the screen to power up their actions, I intend to create a turn-based RPG in which players experience a heightened sense of tension and feel more accomplished for mastery, as opposed to most RPGs that rely entirely on strategy.”

Research and Thesis

My objective is to create a system where the player has to use physicality, rather than pure strategy and logic, to complete a turn-based RPG battle. Ultimately, the player should succeed not as a result of random chance, but as rather due to their reflexes, accuracy, and timing. Traditional turn-based RPGs tend to place an emphasis on strategic gameplay and luck, which in some cases can feel unfair when the player is backed into an unfavorable situation they have no hope to escape. As such, I want to incorporate a simple, rhythm-based combo system so that the player will know that they are at least somewhat responsible for their own success or failure.

My initial look into creating such a system came from playing and examining two games. The first such game is *Mario & Luigi: Superstar Saga* for the Nintendo Gameboy Advance. *Superstar Saga* is an RPG in which the player must make certain inputs – “A” for Mario and “B” for Luigi – to either power up their abilities or dodge enemy attacks. However, in between these precise inputs, combat is still turn-based. The player has as much time as they need to select each character’s action from a menu, giving them plenty of breathing room and downtime. I found this system interesting between it provides the player with a great deal of agency. Certainly, the player might struggle to dodge an attack or to launch a perfect ability a few times, but after enough practice, they will more often than not figure it out. As a result, their success and failure rests squarely on their shoulders, and concepts like stats and equipment only supplement the player’s own skill.

That decided, I also wanted to look into rhythm game mechanics more clearly in order to get an idea of how to best implement them in my game. I then chose to examine *Guitar Hero*, the first game in the popular franchise of the same name. Its user interface and combo system interested me. Both are very clear, and the notes are visually distinct from one another. This encouraged me to use different colors – initially green, blue, yellow, orange, and red, which are the same colors used in *Guitar Hero* – to make the in-game notes obvious at a glance. Additionally, I wanted to present the notes scrolling across the screen from left to right, as opposed to the top-down view used in *Guitar Hero*. I made this choice for

two reasons. First, I wanted to give the player more time to see and react to the notes before they reached the designated input point. Second, I wanted to put the notes in a section of the screen where the player could easily see them, and where they would not obstruct the battle itself.

After formulating these initial design decisions, I next looked into a number of questions I had regarding the creation of such a system. In particular, I wanted to examine various rhythm game elements, as the rhythm aspect (and the player's reward for mastering it) is the most important part of the game from a physicality perspective. I found a few research journals discussing the possible benefits of rhythm games, which, in turn, also explained many of their concepts and design choices in great detail. The first such journal comes from the National Center for Biotechnology Information. In it, the researchers place a great emphasis on different types of rhythm games and how they succeed in giving players rhythmic training (Bégel). Keyboard-focused games tend to have "low temporal precision in recording rhythmic performance" (Bégel), as players are given a specific window of opportunity to hit notes (around 100 milliseconds after a beat in *Guitar Hero*, for example), rather than being forced to hit them exactly on the beat (Bégel). Additionally, they usually only utilize four note tracks, in order to match up with the keyboard's arrow keys. This encouraged me to cut the intended number of tracks down to four (now green, blue, orange, and red) and to give the player a generous amount of time to press the button on each beat. In *Project: Nocturne's* system, this involves giving each note a fairly large hitbox. I also decided to design the game so that it controls entirely using the arrow keys, in order to ensure that the player is familiar with the controls and will be able to easily switch between interacting with the menus and interacting with the notes.

The second research journal I examined comes from Dr. Amanda Pasinski of the University of Nevada, Las Vegas. Pasinski covers similar topics to the researchers from the NCBI, but she also notes that rhythm games feature a variety of aspects that will help in my design. For example, she notes that while playing rhythm games, players must "track symbolic representation of notes, ignore distracting stimuli, and attend to multiple objects on the display: all skills requiring visual and spatial processing" (Pasinski 8). Taking this into account, I concluded that I made the correct decision of placing the note track on top of the screen, as doing so allows the player to easily focus on it alone when the time comes to input notes. Additionally, I decided to make the notes more visually distinct between

when the player can and cannot input them, as otherwise, they might not find it fair. This will also help me to make the system more approachable to players who usually prefer turn-based RPGs than on rhythm games. It has also encouraged me to go ahead with the “obstruction” mechanic (where the enemy blocks off part of the note track), which challenges the player from a visual and spatial perspective in addition to a physical one. This, in turn, should create a greater depth of gameplay as the battle wages on.

Having examined these two research journals and having used them to better my game’s design, I next turned my attention toward the ways I could make it feel more enjoyable to play for both seasoned rhythm veterans and for newcomers. To do so, I examined an article from *Gamasutra* by Ryan Clark, creator of the popular rhythm-game-and-roguelike-hybrid *Crypt of the NecroDancer*. Clark spends a great deal of the article discussing the ways that he created and balanced *NecroDancer*’s systems. These include making the window to input movement much more generous and focusing purely on the tactical gameplay (Clark). This is because he wanted to make sure that the roguelike elements consistently felt fair to the player, and incorporating an especially tight window to make inputs would remove that fairness and replace it with frustration (Clark). While my system is not exactly the same as Clark’s, I can certainly learn from many of its elements. In particular, Clark’s use of giving the player the entire beat to make an input is reflected in my plan to make the note hitboxes generous, while the game’s slower soundtrack contrasts with my faster one, with the caveat that the player only has to hit a few specific notes at a time.

System and Mechanics

Given *Project: Nocturne*'s hybridization of turn-based RPG and rhythm game systems and mechanics, it is most appropriate to split them according to their genre.

Turn-Based RPG System:

Stats: *Project: Nocturne* features four basic statistics that determine the player's and the enemy's strengths. Of these statistics, the player can only directly see their HP.

- **HP:** The stat correlating with health. When the player character or the enemy runs out of HP, they lose, and the battle ends.
- **Attack:** A character's Attack determines how much damage they deal to their opponent before factoring in rhythm bonuses.
- **Defense:** A character's Defense stat determines how much damage they take from their opponent's attacks.
- **Agility:** A character's Agility stat determines the order they will act in a given turn.

Turn-Based Combat: At the beginning of each turn, all combatants are placed in two visible queues based on each of their Agility stats. The first queue represents the current turn, while the second represents the next one. Each combatant takes an action when they reach the front of the line, provided that they are still alive, and they are removed from it when said action concludes. Once every character has acted, the "next turn" queue replaces the "current turn" one, and a new "next turn" queue automatically appears in the now-unoccupied location. The battle ends when either every player character or every enemy has died.

Player Character Actions: During their turn, the player must use the arrow keys and spacebar to input a command for the player character. Upon selecting one and choosing a target (see: **Targeting**), the note track becomes active, allowing the player to hit notes and accrue a combo that strengthens their action.

-
- **Attack:** The player character attacks an enemy, dealing damage based on their Attack stat and the combo bonus. The basic damage formula is $([a.Attack * a.Attack] - [t.Defense * t.Defense]) * (Combo Bonus) * (Random\ number\ between\ 0.8\ and\ 1.0)$, where “a” is the attacker and “t” is the target.
 - **Guard:** The player character guards, taking reduced damage for one turn. The combo bonus further decreases the amount of the damage to the player character.
 - **Heal:** The player character restores a certain amount of their HP. The combo bonus improves the amount of HP it restores, starting with a pitiful amount and increasing from there.

Targeting: After selecting an action, the player is prompted to select a target using a combination of the arrow keys and the spacebar. They can also press the escape key to return to the ability selection menu. While choosing a target enemy, the player can see the currently selected foe’s name, current HP percentage, and elemental affinity. Additionally, targeted characters’ images highlight in blue on the turn order queue.

End State: There are two main end states:

- If the player character reduces the enemy’s HP to zero, the player wins the battle.
- If the enemy reduces the player character’s HP to zero, it wins the battle.

Rhythm System:

Note Track and Scrolling: When the player selects an action, notes begin scrolling across the track at the top of the screen in time with the music. They move in four lines, and each note is marked with an arrow pointing up, left, right, or down. When a note reaches the right side of the track, it instantly disappears.

Note Input: After the player selects an action to perform on their turn (see: **Player Character Actions**), several notes spawn onscreen (equal to a number listed on the chosen action). The player can then make inputs to try and hit the notes until all of them disappear. There are four input nodes on the right side of the track, which are

arranged vertically. Each node corresponds to the arrow key displayed on the notes that spawn in their relevant row.

Combos: If the player activates a node when a corresponding note enters it but before it leaves, the note disappears and a number representing the player's current combo increases by one. Missing a note causes the player's combo to decrease by one, instead. The game uses the player's final combo number to determine the efficacy of their chosen action.

Obstructions: After the player has depleted half of the boss enemy's HP, it generates a stream of mist that obstructs the player's view of the note track's left side. This obstruction lasts until the end of the battle.

PROJECT:

NOCTURNE

Visual Design Document

Defeat your enemies with the power of rhythm!

Controls

Choose Actions Hit Notes	Select Actions	Exit Targeting

Choose a move each turn!

Ability Menu

Guard - Ability Name

Take reduced damage until your next turn. - Description

Notes: [5] - Total Notes

Range: 25% - 75% - Effect Range

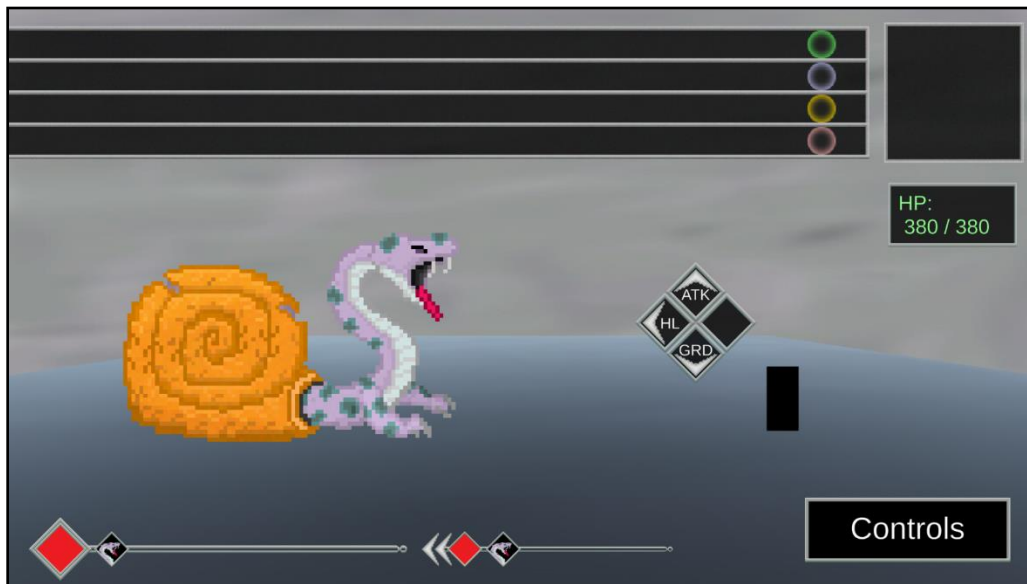
Spawn Notes

Hit the notes to improve your combo!

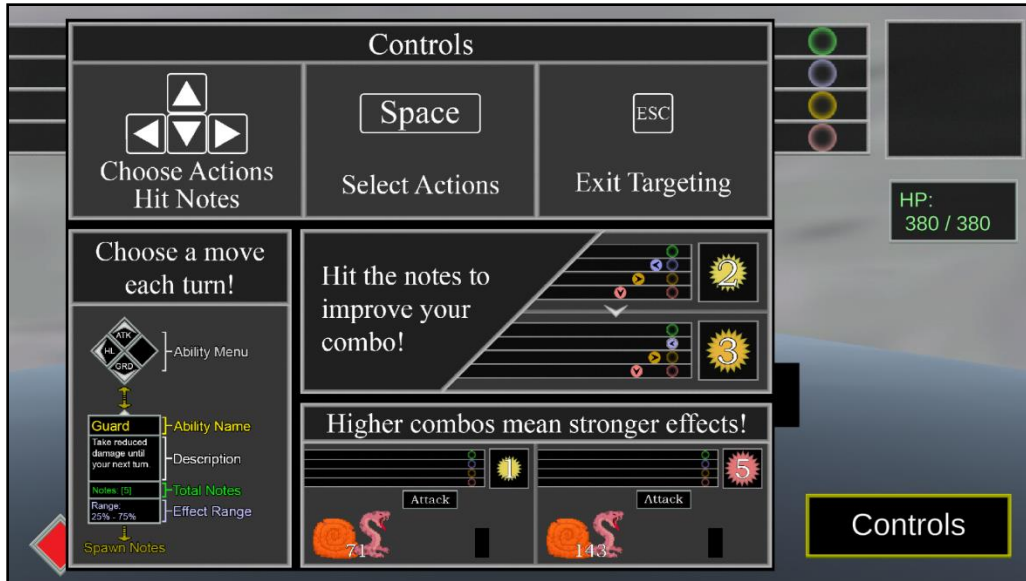
Higher combos mean stronger effects!

System Storyboard

This section contains a basic storyboard of *Project: Nocturne*'s gameplay. The storyboard includes a depiction of the main system, the RPG and rhythm mechanics, the enemy AI, and the win and loss conditions.



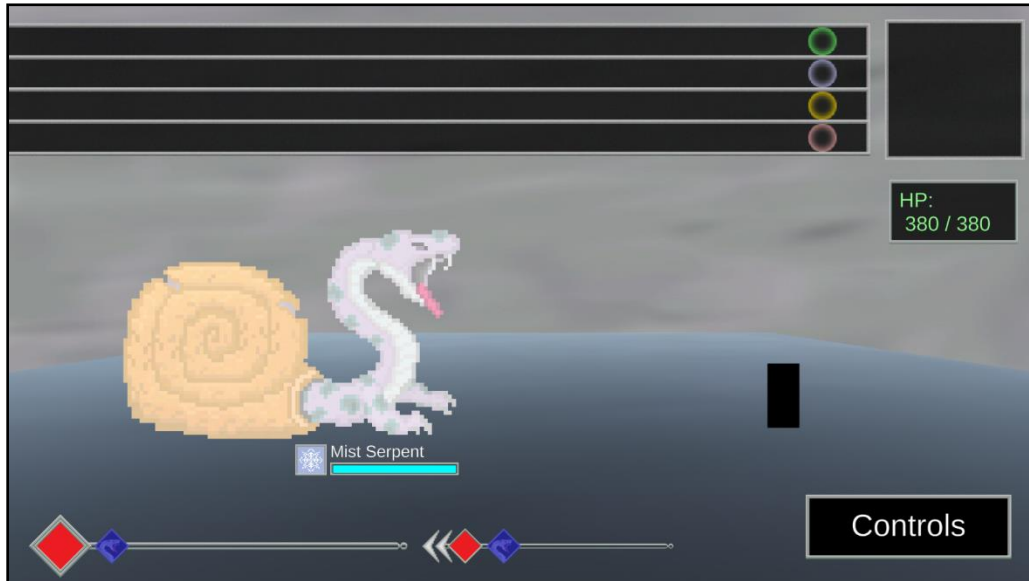
Upon starting the game, the player finds themselves in battle against the Mist Serpent, the enemy of the system prototype (left). They can also immediately see the note track (top), the ability menu (left of the player character), the player character's health (top-right), the turn order display (bottom), and the "Controls" button (bottom-right).



In order to make sure that they understand the basic gameplay, the player uses their mouse to press the “Controls” button. This opens a menu that either teaches the player or refreshes them on the system’s mechanics and controls. While the menu is open, the player cannot make any other inputs. They can press “Controls” a second time to close this menu.



The player uses the arrow keys to maneuver through the player’s menu. By pressing the up arrow key, the menu shifts downward, revealing another menu displaying the “Attack” command. The player can either press the down arrow to return to the diamond-shaped menu, or they can press the spacebar to enter the targeting phase.



Upon selecting the ability, the player targets the Mist Serpent. This causes it to glow white; displays its name, health percentage, and elemental affinity; and adds a blue overlay to its icon on the turn order display. As such, the player is aware that they are targeting this particular foe. The player presses the spacebar a second time to select the Mist Serpent as their target.



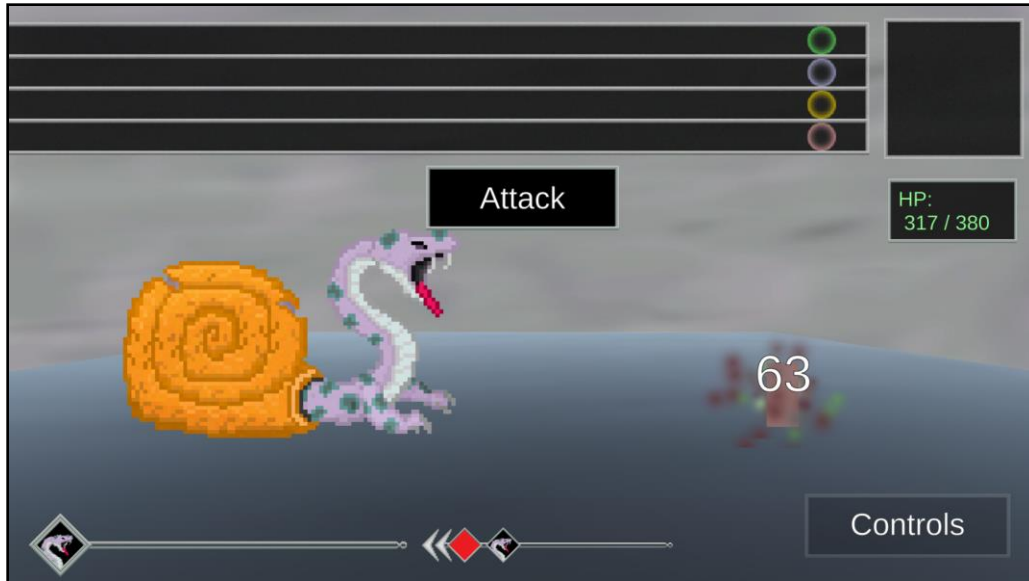
This activates the current ability. Because the “Attack” menu has a section reading “Notes: [5]”, five notes spawn in from the left sign of the screen. This immediately informs the player that they can interact with the note track, and that these are the notes they must hit to empower their ability. Note that while in this state, the player cannot press the “Controls” button.



The player hits one of the notes as it approaches the track's right side. This causes their combo to increase, which is shown via a brief animation (top-right). Note that the combo is displayed over a small, yellow starburst. The starburst's color and size correlate with the player's combo, going from yellow (low) to orange (medium) to red (high).



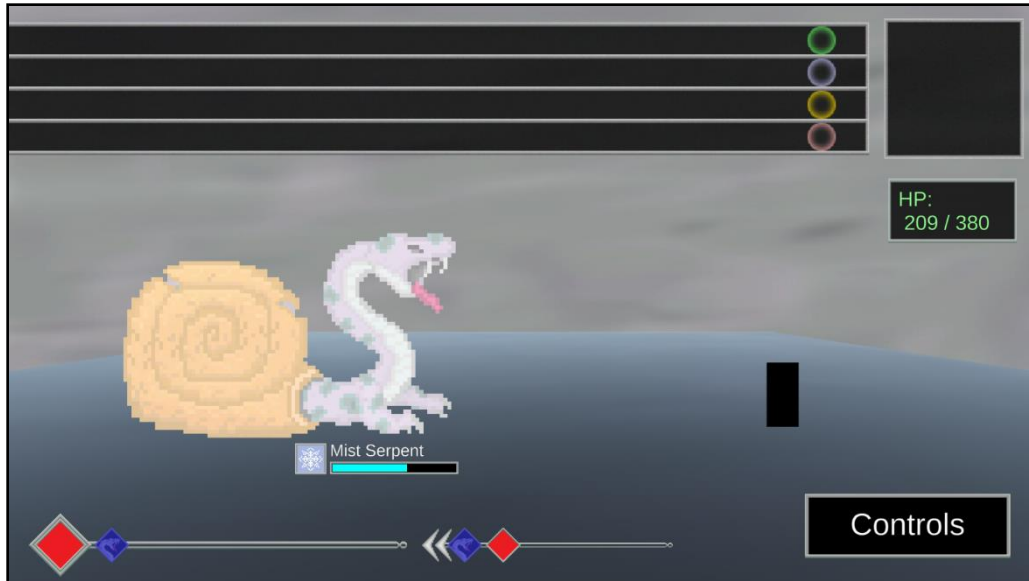
After the last note vanishes, the player's action occurs and the Mist Serpent takes damage (left). The serpent's sprite briefly turns red, a particle effect plays, and its health bar decreases to provide better visual feedback. However, because the player only hit one note out of five, their attack has a relatively low effect (only hitting for 85% of its normal damage).



The Mist Serpent then takes its turn, following up the player's attack with one of its own. Unlike the player, the serpent's abilities deal a consistent amount of damage. This makes it easier for the player to prepare their next action accordingly. Note that when the player takes damage, their sprite briefly flashes red, and a particle effect plays.



On their next turn, the player selects "Attack" again. This time, they manage to hit all five notes perfectly, resulting in their attack dealing far more damage than before, along with generating a larger particle effect. The disparity between hitting zero notes (75% attack power) and hitting every note (150% power) encourages the player to perform as well as possible.



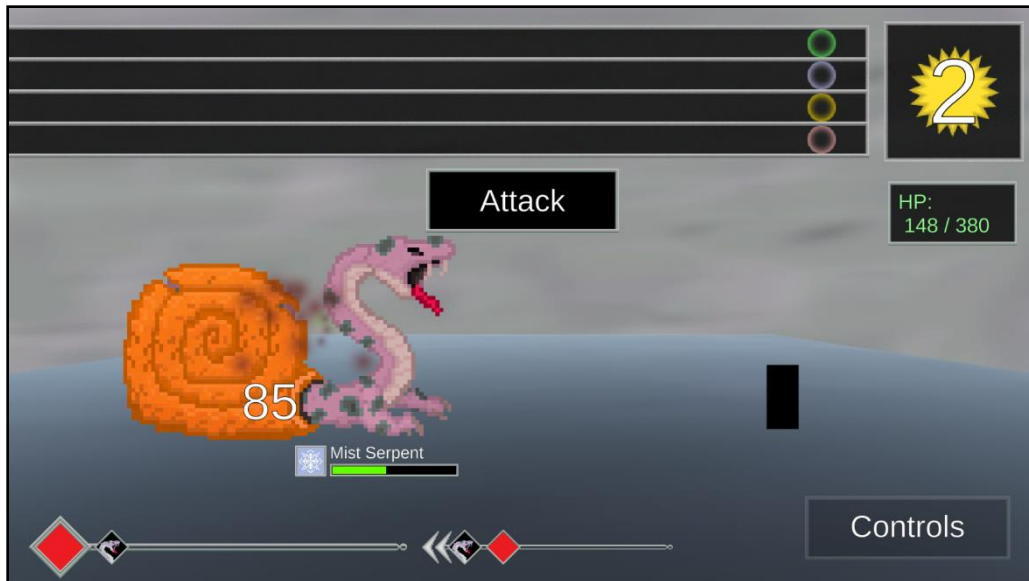
Several turns later, the player plans to attack the Mist Serpent yet again. However, their HP is fairly low, and they notice on the turn order indicator that the Mist Serpent is going to take two turns in a row. As such, the player is forced to reconsider their tactics.



The player presses the escape key to stop targeting the enemy, instead using the “First Aid” ability to heal. Healing is intended to be far more intense than attacking, because while healing only uses four notes, the player’s price for failing to hit an adequate number of them is far more severe. Healing ranges from 20 HP (zero notes) to 100 HP (all four notes).



Not long after that, the player gains two turns in a row. They decide to take the opportunity to perform an all-out assault on the Mist Serpent.



In the process, they manage to reduce the Mist Serpent's HP below half, which changes the color of its health bar. The color changes a second time if the player manages to reduce it below 25%. During this process, however, they missed several notes, reducing their combo and causing their attacks to deal less damage.



With half its HP gone, the Mist Serpent uses a unique ability that obstructs the leftmost section of the note track. The player now has only about half as much time to process oncoming notes as before, which is intended to ramp up the tension in the latter half of the battle.



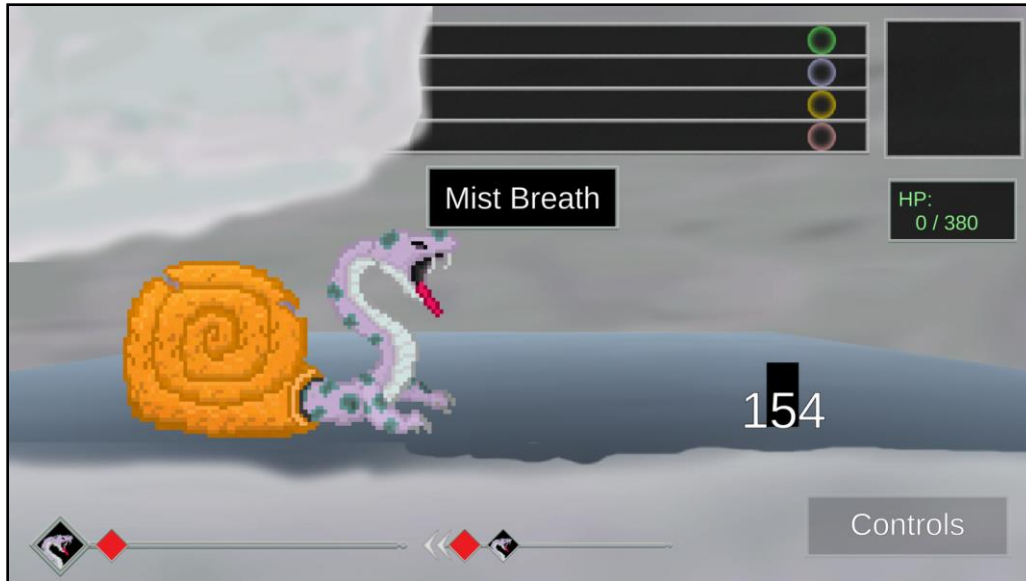
Around this time, the Mist Serpent also gains a new, more powerful attack that takes a turn to charge up. Because it is telegraphed beforehand, the player should have time to either guard or heal before it lands.



The serpent's charge attack removes a massive amount of the player character's HP if they do not prepare for it. It serves as the final obstacle the player must overcome in order to prove victorious, forcing them to keep a cool head while juggling attacking, guarding, and healing. This is especially important in cases where the Mist Serpent has two turns in a row, as it can charge up and attack immediately.



Finally, the player manages to deplete the Mist Serpent's HP to zero. The serpent immediately dies in a large, flashy animation. This should provide the player with a combined sense of relief and satisfaction, especially if they struggled to deal damage during the second half of the battle.



Alternatively, the Mist Serpent reduces the player's HP to zero, causing them to lose the encounter. In this case, the player is forced to restart the encounter from the beginning.

QA Testing

Test Plan (February 7, 2019):

Goal: The goal of this test is to gain feedback and to establish whether or not *Project: Nocturne's* system is successful in achieving my original intent. Questions and analysis will focus on both the rhythm mechanics and the RPG mechanics, with a particular emphasis on how they affect one another. I will consider this prototype successful if testers react favorably towards the rhythm mechanics, can understand both them and the controls after a fairly short time spent playing the game, visibly get better at using the system over time, and reveal both tension and excitement at various points. This initial test will take place informally with at least five testers.

Procedure:

1. Introduce testers to the game's concept
2. Show testers either the VDD or the in-game "How to Play" page to familiarize them with the controls
3. Have testers play through the battle at least one time
 - a. If they cannot defeat the boss, give them the option to play again
 - b. While they play, observe their emotional responses to the system
4. Once the tester is finished playing, ask them to fill out the survey

Questions:

1. Did you defeat the boss?
2. Do you feel that the rhythm-based gameplay added to or detracted from the RPG elements?
3. Why do you feel this way?
4. Was it immediately clear whether or not you were allowed to interact with the notes or the menu?
5. Was it immediately clear which notes you could and could not interact with?
6. When you first started playing, did you find it easy or difficult to hit the scrolling notes?

7. If you found it difficult, did it become easier to hit the notes as you continued playing?
8. Did you find it tedious waiting for the notes to scroll past?
9. Did the controls all being tied to the arrow keys make it easier to understand the gameplay?
10. What impact, if any, did the mist obstruction have on your ability to hit notes?
11. What impact, if any, did the boss's charge-up attack ("Mist Fang") have on your playstyle?

Survey Link: <https://goo.gl/forms/1f8xGAGnFP8ygZ802>

Test Process:

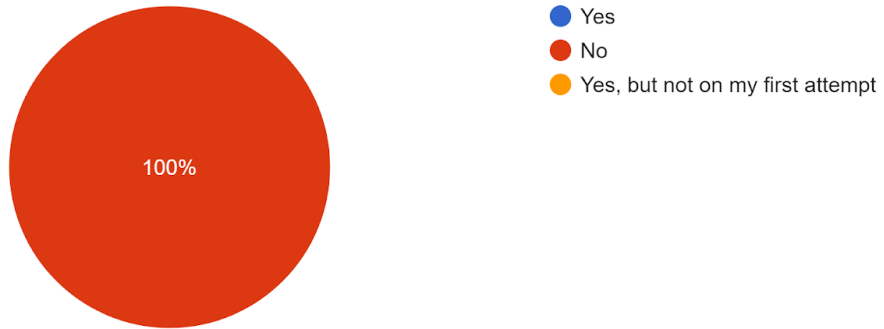
Summary: On February 7, 2019, I sat down in CCM 224 and tested the mostly complete version of *Project: Nocturne* with five different game design students. While this might not allow for a totally unbiased test, it should be noted that each tester had different tastes when it came to preferred genres, ranging from enjoying RPGs or rhythm games to disliking either genre. This allowed for a more interesting set of tests, with most of the results – as well as in-test observations and post-test reworkings of the systems – providing clear feedback for the system.

Test Results:

Question 1:

Did you defeat the boss?

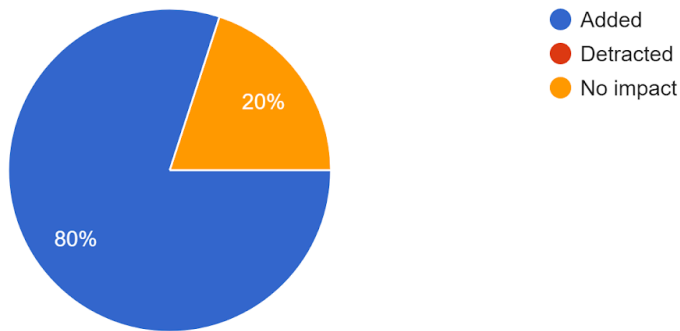
5 responses



Question 2:

Do you feel that the rhythm elements added to or detracted from the RPG elements?

5 responses



Question 3:

Why do you feel that the rhythm elements had this impact?

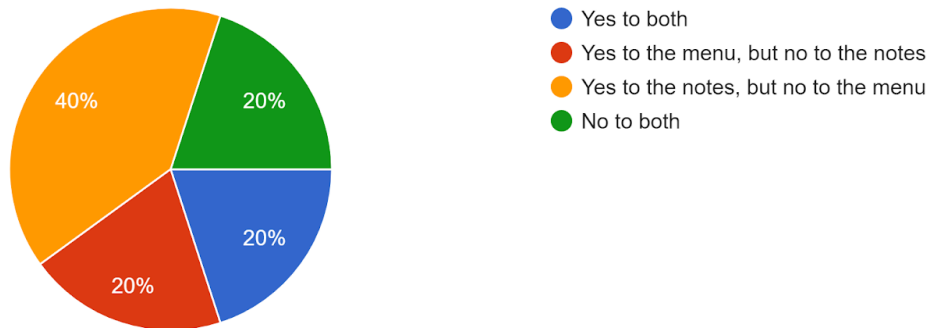
5 responses

- rpgs aren't my thing
- It adds a skill based aspect.
- The added rhythm adds a lot more than simply waiting for your turn.
- The relationship between the enemy's moves (smoke screen) and the rythm elements were cool
- The difficulty of it increased the tension and intensity; I felt like I was dealing with a powerful monster.

Question 4:

Was it immediately clear whether or not you were allowed to interact with the notes and the menu?

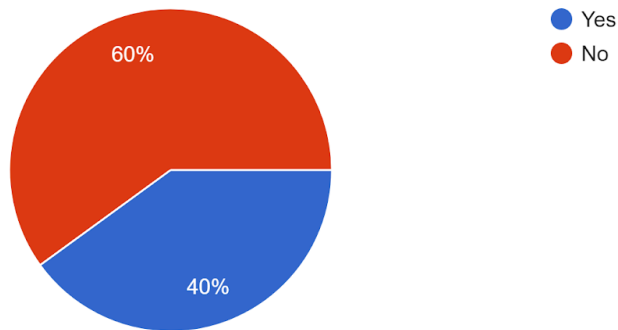
5 responses



Question 5:

Was it immediately clear which notes you could and could not interact with?

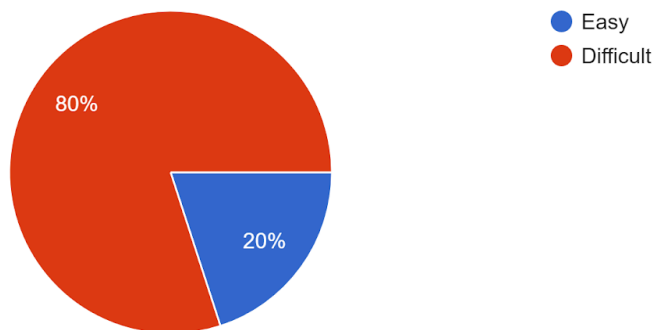
5 responses



Question 6:

When you first started playing, did you find it easy or difficult to hit the scrolling notes?

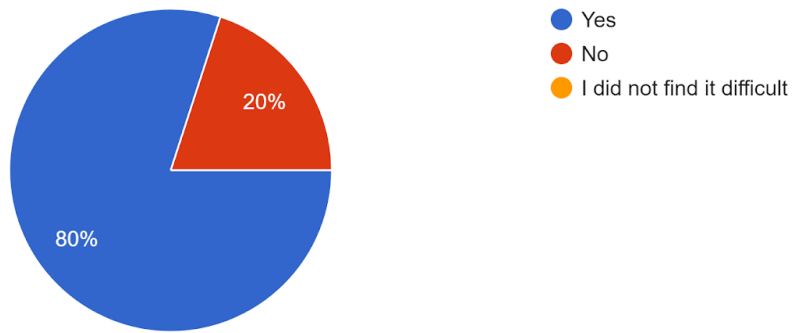
5 responses



Question 7:

If you found it difficult, did it become easier to hit the notes as you continued playing?

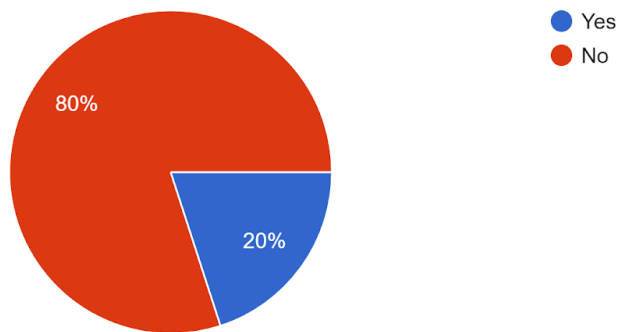
5 responses



Question 8:

Did you find it tedious waiting for the notes to scroll past?

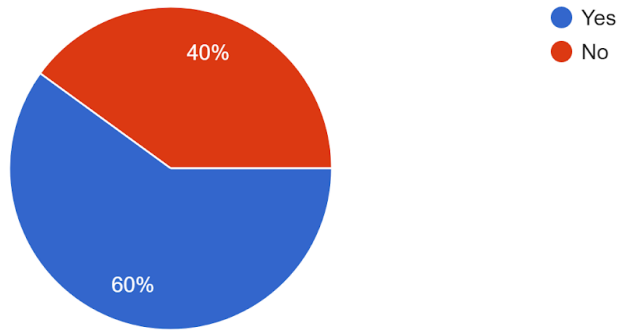
5 responses



Question 9:

Did the controls all being tied to the arrow keys make it easier to understand the gameplay?

5 responses



Question 10:

What impact, if any, did the mist obstruction have on your ability to hit notes?

5 responses

- slightly more difficult
- I couldn't react fast enough.
- The mist made it slightly harder to hit the notes. More obstruction effects would be cool! Think electricity jumbling up the notes or making your vision weird.
- made it a little harder, cool idea
- I had to rely more on my reaction timing.

Question 11:

Why do you feel that the rhythm elements had this impact?

5 responses

rpgs aren't my thing

It adds a skill based aspect.

The added rhythm adds a lot more than simply waiting for your turn.

The relationship between the enemy's moves (smoke screen) and the rhythm elements were cool

The difficulty of it increased the tension and intensity; I felt like I was dealing with a powerful monster.

Test Observations:

- No tester defeated the boss during the main testing period due to the game's then-current iteration having a 90 second time limit. After I removed this limit post-test, players were able to complete it without issue.
 - Testers seemed confused about which notes they could and could not interact with. Most of them did not understand that there was a difference between the transparent and opaque notes.
 - Testers often did not realize when their turn had come up and stared at the screen without inputting any commands into the player's menu.
 - Similarly, some testers had difficulty figuring out the menu system at first, but all of them grasped it fairly well by the end of the play session.
 - Testers all showed interest in the game's concept and gameplay.
-

QA Analysis:

The prototype managed to appeal to testers and shows promise, but there are multiple issues that need to be ironed out. First and foremost, the fact that no player was unable to defeat the boss before 90 seconds passed – even when I

halved its HP and made it less of a threat – makes it clear to me that the time limit was far too tight, especially given that players had a difficult time getting used to the game’s mechanics. Many players ran out of time before the Mist Serpent fell below 50% of its health, which means they were unable to deal around 400 damage in that time even when their attacks hit for about a quarter of that at a time. In addition, only one player had their HP reduced to zero, furthering my suspicions that time was the player’s main enemy. This makes it clear that combining time constraints with unfamiliarity was a major mistake on my part, and as can be seen after solving this issue by implementing a loop into the song, fixing even one of the two issues made players far more likely to make it to the end.

However, this does not absolve the game of its other major issue, which is that testers often struggled to understand the controls and could not differentiate between active and inactive notes. This was particularly noticeable in the early stages of testing, where one player assumed the controls did not work properly because the semi-transparent notes did not disappear after they performed inputs. Testers showed stronger performance after learning of this, but some still struggled because the colors were too similar. As such, I may make the scrolling notes much darker, make them grayscale, or make them completely transparent in future iterations of this system. I can likewise fix the issues with the main menu by making the player’s options more obvious. For example, I can add arrows to the “Attack”, “First Aid”, and “Guard” menus that show them how to return to the diamond-shaped menu and how to activate the ability. Auditory feedback or using visuals to draw players’ attention to key points on the screen will also make it easier for players to understand the battle system more. One idea might involve placing a queue on the screen that shows the order each combatant acts in during battle, which should inform the player when their turn comes up.

Aside from these issues regarding interaction and timing, testers reacted positively to the game’s theme and gameplay system. Even a tester who claimed to dislike turn-based RPGs referred to it as a “pretty dope game”, and others showed interest in seeing it as a full title, rather than a single combat instance. Players also showed marked improvement in the game’s systems over time, reacted excitedly when they achieved mastery, and remarked that the mist obstruction and the boss’s charge attack changed their playstyle if they reached that part of the fight. At least one tester also played the game through to the end after I implemented looping notes and claimed to enjoy it immensely, showing that it has the potential to draw

players in beyond a simple passing interest in the system's concept. These reactions all fall in line with my intended player experience.

Survey Link:

https://docs.google.com/spreadsheets/d/1Yns3i_2bqF2yNHU6-r_8GTwg6CEyT7DVKqZYcN2OEWo/edit?usp=sharing

Postmortem

Initial Postmortem:

Given the feedback I received from QA testing, it is clear that this system proved successful overall, even though a number of issues with readability drag it down. My testing was also rife with issues thanks to the 90 second time limit, which only existed because I wanted to test the game without implementing note-looping beforehand. Additionally, there were cases where I did not explain the systems as well as I should have, which did not help the aforementioned problems testers had understanding the UI. That said, after adding the note-looping and improving communication, players quickly adapted to *Project: Nocturne*'s system, and every tester reacted positively to its concept and gameplay. Most testers claimed that the rhythm mechanics added a lot to the turn-based RPG gameplay, forcing them to pay constant attention from start to finish instead of allowing them to zone out for large periods at a time. This, along with the players' signs of tension during dire moments and excitement over mastery, is evidence that I managed to fulfil my intent. Player feedback is also extremely clear when the player is dealing damage, restoring health, hitting notes, or killing the enemy. This likely made it easier for players to become invested in the prototype and system.

Overall, I found this project to be a very rewarding, if somewhat stressful, experience. It taught me a great deal about when it is and is not appropriate to test a game. I also realized that a prototype like this does not need so much polish, as I sank far too much time into creating assets when simple boxes (such as the one that I used for the player character) would have sufficed. The concept was already fairly extravagant in its base form thanks to the complexities of both rhythm game and turn-based RPG systems. That said, doing so also allowed me to implement the aforementioned strong player feedback, making it clear that I must not totally neglect this polish, even if I should focus on the game above all else and strive not to overwork myself.

Postmortem on Iteration 1:

Between my last test session and now, I have changed several aspects of the game in accordance with the feedback I received from testers and from my professor. Unfortunately, I have not had the opportunity to perform even informal QA regarding these changes as of May 3, 2019, but I plan to do so in the near future. However, I do know that I have achieved my original intent statement, that none of my changes should interfere with this success in any way, and that people who have seen my alterations firsthand have displayed overwhelmingly positive reactions. My adjustments are as follows:

- I implemented more user feedback via sound and particle effects. User feedback was the most lacking aspect of my original design, so I decided to heavily focus on it this time around. Every ability now has a unique particle effect and sound effect. Their size and sound also change based on the player's combo rating. In doing so, I intended to make stronger attacks feel more impactful and satisfying. Furthermore, I implemented sound effects for menu assets, creating more feedback there, as well.
- Semitransparent notes no longer exist. This is primarily due to the confusion several of my testers faced as a result of them looking nearly identical to the opaque notes. As such, I decided to remove them entirely and made it so that notes only appear after the player both selects an ability and chooses a target. This should make the game easier to understand and to reduce player frustration.
- The system now features several more complex RPG mechanics. These mechanics include a turn order display, a targeting mechanic, and an enemy name and health display. The turn order display and the enemy health display both contribute towards my intent statement. They both encourage the player to carefully weigh their options, and in cases where their enemies either have low health or are taking several actions in a row, they may experience a heightened sense of tension due to them needing to hit a certain number of notes to either prove victorious or survive. The other aspects – especially the targeting mechanic and enemy name display – are mainly cosmetic due to the prototype only involving a single enemy. In future iterations, however, I plan to implement more enemies into the system,

which should make these systems more meaningful and valuable to player progression.

- The game no longer controls entirely via arrow keys. During initial testing, players often struggled to understand the controls, especially on the main menu. Arrow keys also did not work with my initial plan to implement enemy targeting, as I could not find a viable way for the player to select a target or exit targeting without restricting their movement options. Because of this, I decided to implement mouse functionality for selecting menu buttons and controls for the spacebar and escape key. To further alleviate player confusion, I also placed a simple button in each of the main combat scenes that displays the in-game controls and basic mechanics.
- I implemented new difficulty options. Originally, several players complained that the system was too inconsistent in terms of difficulty. The Mist Serpent had too much health and dealt too much damage, while it was far too easy to reach high combos due to there being no penalty for missing notes. I decided to fix both of these issues in the current iteration of *Project: Nocturne*. In order to reduce the Mist Serpent's high difficulty, I halved its HP and reduced its Attack, which makes it far more manageable. However, I also decided to keep the original variant in as a "Hard Mode" battle in order to give players who are interested in the system a more difficult opponent. To ensure that they cannot simply mash the arrow keys to get high combos, I then implemented a mechanic in which the player's score decreases whenever they miss notes. This should hopefully make *Project: Nocturne*'s difficulty more consistent, thus making the system more enjoyable to play.

As a whole, I am satisfied with the progress I have made on *Project: Nocturne*. Iterating on this system has proved to be a very rewarding experience, and I have gained further knowledge of implementing user feedback as a result of it. That said, it did not come without its issues. While user feedback was undoubtedly the most lacking part of my initial prototype, I focused too heavily on the RPG mechanics – especially on creating the turn order display and targeting – at the beginning of this development cycle. These aspects are undoubtedly important (or, at very least, they will be in future iterations), but I believe I should

have spent more time implementing sound and visual effects, rather than putting them off until the last minute. Doing so made it difficult for me to test my changes even informally, resulting in me not having solid results for the current iteration. Because of this, I plan to focus entirely on fixing any pre-existing issues before adding new mechanics in the future, even if I have to put certain ideas on the backburner to do so.

Annotated Bibliography

Bégel, Valentin, et al. "Music Games: Potential Application and Considerations for Rhythmic Training." *National Center for Biotechnology Information*, 8 May 2017.

This research journal from the National Center for Biotechnology Information discusses the means by which rhythm-focused video games can be used as tools to train related skills. It is a published, peer-reviewed paper that received correspondence from neuroscientist Valentin Bégel and Dr. Simone Dalla Bella, a psychology professor at the University of Montreal.

- The journal focuses primarily on the various types of rhythm games.
- The researchers purport that each type has different applications in terms of rhythm training.
 - For example, they note that games which require full-body movement have more potential as rhythm-training programs, given that they provide a "motivating setting" in addition to examining player movements.
 - Computer or console games that require finger-tapping tend to be less precise when it comes to recording player performance due to them having a fairly sizeable, generous window of opportunity for the player to enter a keypress.
 - They often use keyboard arrows to check for player input, and they also use the player's performance to compute a score.

This article is particularly important for its explanation of how keyboard-based rhythm games tend to offer players fairly generous periods of time, as well as their use of arrow keys (indicating only four music channels as opposed to *Guitar Hero's* five) and scoring system. Such aspects will certainly help me to improve my game's feel, as well as to implement basic mechanics while also allowing for more unique ones along the way.

Clark, Ryan. "Game Design Deep Dive: Finding the Beat in Crypt of the NecroDancer." *Gamasutra*, UBM, 17 Sept. 2014.

In this *Gamasutra* article, game designer and programmer Ryan Clark discusses the creative process behind his game *Crypt of the NecroDancer* and its unique blend of roguelike and rhythm-game elements. In particular, he goes in-depth regarding specific instances of the game's design, such as the means by which he related it to other games from its two genres and his efforts in making sure neither element choked out the other.

- Clark writes about the inspiration coming from wanting to create a roguelike that feels "fair" to play.
 - He defines "fairness" as being difficulty that the player can blame on themselves, rather than on the game.
- He also notes that, originally, he gave players a 20% leeway per beat to make an input (100ms in a 120bpm song) before they failed to move.
 - Later, he increased this number to 100% in order to make the game feel better and to prevent players from having difficulty against surprising enemies.
 - In rhythm games, the player is expected to simply obey commands, with a heavy focus on accuracy, which Clark could not emulate if he wanted the game to feel truly fair.
- The key to his design was iteration and staying open to having the game go somewhere he did not expect.

Being that *Crypt of the NecroDancer* merges together two unlike game concepts, it is extremely valuable for me to have this sort of article from the game's main designer and programmer. It gives me increased insight into how I can best design this sort of game, given that it also merges two divergent game concepts together.

Guitar Hero. Sony Playstation 2, Harmonix, 2005.

Guitar Hero is a rhythm game released for Sony's Playstation 2. This title only saw a single release in 2005, but the massive number of games in the *Guitar Hero* series – with the latest one being released in 2015 –, as well as

the prominence of similar titles like *Clone Hero*, makes it clear that the series is very popular.

- The game features unique gameplay, in which the player must use a guitar-shaped controller to hit notes as they scroll down the screen.
- The player's score and combo both increase depending on the number of notes they hit in a row.
- Their combo resets whenever they miss a note.
 - If the player misses too many notes, they fail instantly.
- Each song features a different set of notes for the player to hit, as well as several difficulty settings to further increase replayability.

This simple rhythm-based gameplay and the use of a combo system is what most interests me about *Guitar Hero*. Providing the player with a visible mark of success and rewarding them for complete mastery generates a sense of accomplishment and excitement, which I would like to emulate in my system.

Mario & Luigi: Superstar Saga. Nintendo Gameboy Advance, AlphaDream, 2003.

Mario & Luigi: Superstar Saga is a turn-based RPG originally released on the Nintendo Gameboy Advance. It has seen both a re-release in 2014 for the Wii U's Virtual Console and a full-blown remake in 2017 for the Nintendo 3DS. This means that the game is finished and has likely attracted a fairly sizeable fanbase.

- Gameplay features a turn-based combat system in which the player uses Mario and Luigi's various abilities to defeat a number of unique enemies and bosses.
- Every turn, the can input a single action for each brother – ranging from jumping to using hammers to using special skills.
- They must then complete a short timing challenge involving button presses (“A” for Mario, “B” for Luigi, and both for combination attacks).
 - The brothers' attacks become either more or less powerful depending on the player's speed and accuracy.
- On enemy turns, the player must complete a similar challenge to either dodge or counter their foes' attacks.

-
- Failure to do so results in the player taking damage or facing some other negative effect.
 - This creates a simple-yet-intricate battle system where the player is rewarded for skillful play and is punished for the opposite, though said punishment is rarely severe.

This greatly interests me, if only because it provides the player with greater agency than the typical turn-based RPG, and it gives them more opportunities to prevail in otherwise-deadly situations. Additionally, the fact that this title was the first in a long-running series and has been both re-released and remade informs me that its combat system is at least somewhat popular. This lets me know that a rhythm-based combat system also probably has potential, encouraging me further.

Pasinski, Amanda. "Possible Benefits of Playing Music Video Games." *Semantic Scholar*, 1 Dec. 2014.

In this journal by Dr. Amanda Paskinski from the University of Nevada, Las Vegas, Pasinski discusses a study in which she researched the means by which rhythm games can improve their players' physical and cognitive aptitude. Pasinski is a psychology professor with several published papers.

- It primarily focuses on the means by which musicians tend to have stronger motor coordination, synchronization, and skills regarding pitch and tempo, which Pasinski theorizes also holds true, to some degree, for people who play music-focused video games.
- She also notes that they must use visual and spatial processing to develop skills in tracking notes, ignoring external stimuli, and attending to many objects at once.
- Rhythm games must cater to this playstyle in order to both help players develop these skills further and to ensure that seasoned players can benefit from them.

This last point is especially important in developing my system. Understanding how best to frame the rhythm aspect will help me to make it feel fairer and more satisfying for players to complete. Additionally, it will help me to implement the obstruction mechanic in a way that rewards skillful

play without alienating RPG players, who are typically not used to this sort of physicality.