

Article

Orpheus' Journey - a Serious Game For The Opera "l'Orfeo"

Leonie Wargitsch ¹, Felix Bartossek ¹ and Matthias Mitschele ¹

¹ Technical University of Munich, Germany;

Abstract: Serious Games have been proven valuable as a tool in multiple areas of application. They can be used to educate players about a certain topic and, as we will show in this paper, can also be useful to prepare viewers of an opera about its contents.

To have a better viewing experience when watching an opera, it is often important to be educated about the story behind the performance. We improved a point-and-click adventure serious game called *Orpheus' Journey* by Wargitsch [1] covering the contents of Monteverdi's opera *l'Orfeo*, which aims to convey the ancient legend of Orpheus and Eurydice in a more engaging way by utilizing interactive elements. We will describe the structure and elements of the game, in addition to the improvements made since the last version, including new music-sequences, visual elements, as well as dynamic music of the opera that reacts to events in the game. All relevant files and code can be found at <https://gitlab.lrz.de/ga92yil/orpheus>.

Keywords: Serious Game; Opera; Greek Mythology; Music;

1. Introduction

Visiting the opera usually includes additional preparation as knowledge of the story and context of an opera greatly improves the viewer's experience. Traditionally, this preparation is achieved by reading an opera guide that gives an overview over the characters and story of the respective opera [2] [3]. Wargitsch showed in her 2022 thesis *Orpheus' Journey - Using Serious Games to Prepare for an Opera Visit of Monteverdi's l'Orfeo*, that a serious game might work well to replace this traditional kind of preparation [1]. In this project we set out to improve and extend her original work, adding new content as well as additional features to the game.

Using a game as an opera guide has multiple beneficial effects. Instead of simply presenting the story of the opera, the player learns not just the story behind it, but already learns to associate it with the music of the opera as well. While playing the game does take more time than simply reading the guide, it also offers a fun experience beyond the pure narrative capabilities. Furthermore, in the context of a point-and-click adventure game, it is easy to add additional tidbits to the story beyond the textual canon.

Monteverdi's opera *l'Orfeo* [2] is a very promising subject to apply this concept on. The story of Orpheus is already deeply about music, so the representation as a rhythm game fits perfectly. Additionally, the character Orpheus stems from a broader mythological context, whose rich world can be alluded to in the game, potentially invoking interest in the player to learn more about it.

2. Related Work

2.1. Serious Games

Serious games are digital games used for other purposes besides entertainment and have multitude of application areas [4]. They can for example be used to educate a player about a certain topic and prove their effectiveness due to their potential to engage players.

Citation: Wargitsch, L.; Bartossek, F.; Mitschele, M. *Orpheus' Journey*.

Electronics **2024**, *1*, 0. <https://doi.org/>

Received:

Accepted:

Published:

Copyright: © 2024 by the authors.

Submitted to *Electronics* for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Serious games have also been used to teach different concepts about music. They have been applied to train rhythm skills [5] or to teach concepts about music theory as shown by Baratè et. al. [6]. Kim et. al. have developed a serious game which relates to our project as it also covers contents of an opera. It is designed to teach students about the characters featured in the story of Mozart's opera *The Magic Flute* through interactive means [7].

2.2. Point-and-Click Adventure Games

2D point-and-click adventure games are one of the first genres of games that allowed developers to tell an interesting story in combination with great looking visuals, which are one of the most important elements of games in this genre [8]. Some early adventure games are titles like *Sam & Max* [9], *Monkey Island* [10] or *Grim Fandango* [11] which all have been very successful, making this genre a core element of gaming history. As these games are such a great vehicle for storytelling, this type of genre allows us to tell not just the core elements of the story of Orpheus and Eurydice, but also convey other interesting elements of Greek mythology through optional characters that can be met or unique items that can be found by the player.

2.3. Rhythm and Musical Games

As the focus of an opera is the musical piece, we implemented several music-sequences which aim to merge the gameplay of our game with the music of the opera. Rhythm and music games have a long history in the games industry, with games like *Guitar Hero* [12] or *Crypt of the NecroDancer* [13] where the player is required to press a certain key precisely timed to match the rhythm of the music. The music-sequences implemented in our game are inspired from such games and allow the player to listen to the music of the opera while still keeping them engaged.

3. Previous State of the game

This work is a continuation of Wargitsch's 2022 thesis *Orpheus' Journey - Using Serious Games to Prepare for an Opera Visit of Monteverdi's l'Orfeo* [1]. The result of her initial work was a proof of concept game as well as a user study proving the positive effects of the game when used as preparation for an opera visit.

The game as it was in its previous state tells the story of Orpheus in very close accordance to Monteverdi's opera, using the recording of a 2002 performance as its soundtrack [14]. Its dialogue is largely taken directly from the libretto. This immediate translation of the opera into a game format is supported by beautiful, hand-drawn graphics that directly reference original costumes from various performances of the opera.

For the most part, the game lets the player explore the story of Orpheus in a classical point-and-click adventure game format. The player maneuvers the protagonist through the hills of Thrace and the underworld, interacting with the characters of the opera along the way. Key moments in the story are highlighted by music segments, in which the player plays Orpheus' lyre in the classical *Guitar Hero* [12] fashion.

Although the original game served as an excellent proof of concept, it had some limitations. For one, not all of the three planned music-sequences had been implemented yet. Some scenes of the story had no corresponding graphics, instead presenting dialogue on a black screen. Since the dialogue followed the libretto very closely, there was no place for additional information or clarification beyond the scope of the opera itself. Furthermore, the game lacked any of the typical gameplay elements of a typical point-and-click adventure beyond walking and talking to characters, for example an inventory system or interactive dialogue.

Feedback during the gameplay tests had indicated a demand for more interaction with the world of the game. Another big point of critique was the difficulty of the music-segments. They initially operated on a three heart system, where missing a note resulted in losing



Figure 1. Newly Added Graphic: Hades' Court

one heart and when all three hearts are lost, the player had to replay the scene from the beginning until he could fully complete the level making less than three mistakes in the process. This presented a possible roadblock in the game, as further exploration of the story was gated behind successful completion of the music-sequences. This feedback has been addressed and several improvements have been made and are discussed in the following section 4.

4. Improvements

4.1. Filling Gaps

As the original game was unfinished in several places, a first priority for the project was to complete any missing content. Except for the introduction, which is intentionally left dark since it doesn't take place inside the storyworld of the game, almost every scene now has hand-painted graphics, a soundtrack and fully fleshed out dialogue. All music-sequences are now fully implemented and match the selected songs.

4.2. Interactive World

In this section we describe the modifications made to the game to address the players' feedback of the last version, desiring an increased level of interactability with the world.

4.2.1. Inventory System

For a new method of interaction with the game world, we decided to implement an inventory system and items in the classical point-and-click adventure game fashion. Players are now able to find and pick up items along the way that open up new dialogue options with some of the NPCs. This feature is strictly used for optional dialogue in the game, so that the main story of the opera is accessible without picking up a single item. Through this restriction we can ensure that the complete content of the opera is told to the player independent from the items found so that they can progress the story no matter how many items they missed.

4.2.2. NPC Changes

To integrate the inventory in our game, we reworked the dialogue system so that it is now possible to give items to NPCs as a dialogue option when the player has the required item in his inventory. New NPCs have been added to the world that incorporate this feature and large parts of existing dialogue have also been rewritten to improve the experience and make the world feel more alive.



Figure 2. Inventory window containing an item and its description

4.2.3. Customizable Gameplay Experience

These changes and additions to the game world allow the player to choose how deeply they want to engage with the story. If a player is just looking to prepare for the opera, they may simply play the game following its linear path as before, without engaging too much with the optional NPCs or items. Playing the game this way still allows a player to experience the core story the same way as it is told by the opera. People that are interested in further knowledge about Greek mythology in general, as well as details about Orpheus, can now interact with a cast of NPCs, items and background objects that enrich the storyworld.

4.3. New Scenes

Additional adventure scenes have been added in various places that support the new content and features mentioned in section 4.2.

After the player is able to lull the Charon into sleep, he then traverses the river Styx in a boat in the *Crossing the Styx* scene, unlike the previous version of the game where he immediately reached *Hades' Throne*. There he gets a chance to explore the various rivers of the underworld as well as their role and importance in Greek mythology, in addition to reaching the third music-sequence, the *Styx Song* described in detail in section 4.6.

Furthermore, before the *Hades' Throne* scene, another adventure scene has been added called *Hades' Courtyard*. Here the player can make use of some of the items that he discovered on his journey by interacting with new NPCs that have been added for this area. The characters featured in *Hades' Courtyard* include known figures of Greek Mythology like:

- **Achilles**, the greatest of Greek warriors,
- **Narcissus**, who was so handsome he fell in love with his own reflection, and
- **Musaeus**, the well known poet and philosopher.

Other scenes have also been updated to support items, improved dialogue and more new NPCs. In particular the *Way Out* scene has been heavily modified to feature a so called 2.5D perspective. The contents of this scene are described in detail in section 4.7. These new scenes allow for a clearer understanding of how the different parts of the story connect and belong together, creating a more cohesive narrative experience.

4.4. Graphics

All graphics of the game follow a coherent graphical style. They are drawn in 2D in a cartoony, clear style. The designs of all characters are inspired by ancient Greek clothing [15] and costumes from different opera performances, for example Jordi Savall's 2002 Barcelona performance [14].



Figure 3. point-and-click Adventure Style Scene: Orpheus Meets Charon



Figure 4. The Way Out, 2.5D Style Scene

An outlier to the style in the game is the scene for the climax of the game, *Way Out*, where Orpheus' ascends from the underworld. For this section we deemed it important for the player to see the world in the perspective of Orpheus, as he is required to not look back to see if his beloved is following him. To achieve this effect the player now walks around in the environment through the protagonist's perspective in a 2.5D format, where the graphics remain 2D sprites but are designed to convey a sense of depth and perspective as can be seen in figure 4.

4.5. Music Arrangement

A core part of the original concept of *Orpheus' Journey* was the direct connection to the music of Monteverdi's opera. This presents a significant advantage over traditional opera guides - not only does the user get to know the story and characters of the opera, they also learn to associate the individual pieces of music with the parts of the story they correspond to. The visual, textual and musical elements of the game work together to present the story of the opera in its context, rather than just mentioning parts of a whole. Previously, the game used a publicly available recording of a performance for its background music [14]. Going forward, we deemed this to be impractical for a variety of reasons: Not only was it occasionally distracting to hear the original lyrics in the background or to have the recordings loop badly, but it also limited the possibilities of the music-sequences. Other rhythm games like *Metal: Hellsinger* [16] have pioneered different approaches of having the player interact with the music. For the music-sequences, it was desirable to have

the instruments of the digital orchestra separated into multiple layers. As the player plays the game, they can gain combos when they successfully hit multiple notes on time. With a growing combo, more and more instruments join the orchestra, giving a richer sound experience. Having a static recording would have made this kind of interaction impossible. For these reasons, it was useful to create an original arrangement of the opera with separable sound tracks. This way, interaction with the music based on player actions is now possible, loops can be created more smoothly, and additional elements or adaptations can be inserted where necessary.

The arrangement was created in *FLStudio 21*¹, a professional music production environment. It was based on original sheets for the opera and a publicly available, very rudimentary MIDI file of the opera². To achieve an authentic, satisfying orchestral sound, the *SpitfireAudio BBC Symphonic Orchestra plugin*³ was used for a majority of the instruments.

One difficulty this presented was the now total absence of vocals. While this was desirable for the background music during point-and-click scenes, it made it harder to pick interesting songs for the music-sequences, especially since Monteverdi's opera uses very little orchestral accompaniment for plot-heavy parts of the opera. This was mitigated in different ways for the different scenes.

4.6. Music-Sequences

To address the difficulty problem of the three heart system discussed in section 3, we decided to drop this system in its entirety so the player's skill is irrelevant when it comes to progressing the story of the game. We implemented a combo system, where each successive note that is hit successfully, increases the current combo to incentivize the player to still perform the music-sequences to the best of their abilities. Depending on this combo, additional layers are added to the music as described in section 4.5 and the intensity of visual effects during the music-sequence is also increased.

In the previous version of the game, the first music-sequence at the wedding was a song Orpheus sings about Eurydice. This was replaced with the *Wedding Dance* of the nymphs around the lovers, featuring new visuals and gameplay elements as well as a recognizable and well-fitting song from the opera that works well without vocals. Furthermore, while the first draft of the game only contained guitar-hero style music-sequences in which Orpheus played his lyra, this limitation was now not necessary anymore. During the wedding dance, notes sweep onto the screen with the dancers who carry the indicators that tell the player which key to press, as can be seen in figure 5. When the player successfully hits the corresponding key of a note at the right time, the protagonist and his bride perform their dance and the combo is increased.

At the second music-sequence named *Singing for Charon*, where Orpheus' attempts to convince the Charon to allow him passage across the river Styx, orchestral elements of different consecutive songs from the original opera are combined in a medley. To not confuse users, the context and order of the story are preserved. This sequence uses the old guitar-hero style gameplay that was already present in the previous version, but now intersperses the notes with dialogue boxes that further the story. The medley supports this by alternating between calm parts for the dialogue, so the player can focus on reading, and more intense parts when he is required to hit keys for the rhythm game. By only having short sections where the player needs to hit notes, intertwined with parts that require no

¹ <https://www.image-line.com/fl-studio/>

² [https://www.cpdl.org/wiki/index.php/L%27Orfeo,_SV_318_\(Claudio_Monteverdi\)](https://www.cpdl.org/wiki/index.php/L%27Orfeo,_SV_318_(Claudio_Monteverdi))

³ <https://www.spitfireaudio.com/bbc-symphony-orchestra-discover>



Figure 5. First Music-Sequence: Wedding Dance

input, the difficulty of the this scene is now also much easier compared to before. 227

The third music-sequence, located in the *Styx Song* scene, features Orpheus' passage 228
across the Styx, where he is rowing across the river in a boat. The notes float on the 229
river surface and must be hit at a precise timing when reached by the protagonist. This 230
sequence uses a different musical approach, as the original opera has a choir of ghosts 231
that accompany Orpheus here. In lieu of a choir, the arrangement for the game uses a synthetic 232
soundfont to play the role of the ghosts. The specific soundfont is a reference to a popular 233
series of short animated music videos featuring a ghost choir⁴. Visually, Orpheus can be 234
seen rowing across the river with a looping background. 235
236

Featuring different music-sequences with varied visual representations keeps the 237
game interesting, breaking up the monotony of having only one type of sequence as was 238
previously the case. The decision was made to maintain the same input paradigm through- 239
out all sequences while maintaining the same input paradigm so that players don't get 240
confused and there is consistency across all different sequences of the game. 241
242
243

4.7. Way Out Scene 244

Another scene of the game that we focused our attention on is the *Way Out* scene, 245
where Orpheus' ascends from the underworld and the subsequent moment of weakness 246
that leads him to turn around. In the original opera, this scene is a rather quiet and mourn- 247
ful sequence mostly delivered through singing, without much orchestral accompaniment. 248
The first draft of the game inserted another music-sequence here, having Orpheus sing to 249
his wife while they ascended. This was impractical due to the lack of vocals in the new 250
arrangement, and didn't adequately convey the weight of this scene to the overall story. 251
In addition we deemed it difficult to portray the situation during this moment with a 2D 252
game and decided to design this section to be viewed through the eyes of Orpheus. By 253
using a 2.5D first person approach in this scene, it leaves the player wondering if Eurydice 254
is following the protagonist out of the underworld or not. 255

To give the game an appropriate climax, this is the only point at which the musical arrange- 256
ment strongly deviates from the original opera. At this point the game uses an entirely 257
original orchestral track, written in the style of Monteverdi's opera, to support the dramatic 258
development of the story and the weight of the decision. Over the course of three increas- 259
ingly intense parts, tension is built up to the final moment of turning around, after which 260
the distorted reverb of the final note lingers briefly. In addition. during each of these parts 261

⁴ <https://youtu.be/kXF3VYYa5TI>

dialogue windows appear that show Orpheus' thoughts during this moment. While this original track integrates with the rest of the music seamlessly, it is clearly distinguished from the music of Monteverdi's opera by a few features: It is the only song in the game that is set in a minor key, and it is the only song to use distortion as a stylistic instrument. Both of these elements emphasize the tragic weight of the scene and help to create a satisfying climax for the game, even without the moving performance of a singer.

The changes to this part of the game are supposed to better portray the emotions of the protagonist as well as the tension of the situation to the player during this defining part of the story.

5. Final State of the Game

The following table shows the details of each scene as well as its contents and status:

Prologue	
Plot	Musica introduces the story
Characters	Musica
Style	blackscreen with dialogue
Music	Toccatà
Specials	-
Status	unchanged
Wedding	
Plot	Orpheus and Eurydice celebrate their wedding
Characters	Orpheus, Eurydice, Shepherd, Nymphs
Style	point-and-click adventure
Music	Ritornello
Specials	optional item pickup, optional lore dialogue
Status	updated dialogue, added item
Wedding Dance	
Plot	Nymphs dance around the lovers
Characters	Orpheus, Eurydice, Nymphs
Style	music-sequence
Music	Atto Primo II
Specials	dance game
Status	newly added
Eurydice's Death	
Plot	After the wedding, Orpheus rejoins the shepherds, but receives the message of Eurydice's death
Characters	Orpheus, Shepherd, Messenger
Style	point-and-click adventure
Music	Atto Secondo II, Atto Secondo VI
Specials	-
Status	updated dialogue
Orpheus at the Gates of the Underworld	
Plot	Orpheus arrives at the gates of the underworld, guided by Hope
Characters	Orpheus, Hope
Style	point-and-click adventure
Music	Atto Terzo I
Specials	-
Status	unchanged
Meeting Charon	
Plot	Orpheus arrives at the shore of the Styx and finds his way blocked by Charon

Characters	Orpheus, Charon, Ghosts
Style	point-and-click adventure
Music	Atto Terzo III
Specials	optional lore dialogue
Status	updated dialogue
Singing for Charon	
Plot	Orpheus tries to convince Charon to let him pass, lulling him into sleep in the process
Characters	Orpheus, Charon
Style	music-sequence
Music	Medley of Atto Terzo IV-VI
Specials	music-sequence interspersed with dialogue
Status	updated in every aspect except graphics
Crossing the Styx	
Plot	Orpheus rows Charon's boat over the rivers of the underworld
Characters	Orpheus
Style	point-and-click adventure
Music	Atto Terzo VII
Specials	item pickup, optional lore dialogue
Status	newly added
Styx Song	
Plot	Orpheus continues his journey over the Styx
Characters	Orpheus
Style	music-sequence
Music	Atto Terzo VIII
Specials	rowing game
Status	newly added
Hades' Courtyard	
Plot	Orpheus arrives at the palace of Hades and passes through his courtyard full of shades
Characters	Orpheus, Dead trickster, Achilles, Narcissus, Musaeus
Style	point-and-click adventure
Music	Atto Terzo I
Specials	lots of optional dialogue
Status	newly added
Hades' Throne	
Plot	Hades and Persephone watch Orpheus, Persephone convinces her husband to help him
Characters	Hades, Persephone, Orpheus
Style	point-and-click adventure
Music	Atto Quarto I
Specials	-
Status	new graphics and updated dialogue
After Hades' Palace	
Plot	Orpheus leaves Hades' palace, and receives the offer to lead Eurydice out of the underworld as long as he doesn't turn around
Characters	Orpheus, Messenger Shade, Patroclus, Calais
Style	point-and-click adventure
Music	Atto Quarto II
Specials	optional lore dialogue
Status	added multiple NPCs, extended the scene, updated dialogue

Way Out	
Plot	Orpheus leads Eurydice out of the underworld, but doubts himself and finally turns around
Characters	Orpheus
Style	2.5D point-and-click adventure
Music	original composition
Specials	2.5D graphics, original music, option to turn around
Status	newly added
Turning Around	
Plot	Orpheus turns around and sees Eurydice for one last time before she is whisked away
Characters	Orpheus, Eurydice
Style	animations and dialogue
Music	Atto Quarto IV
Specials	-
Status	newly added
Orpheus' Lament	
Plot	Orpheus arrives back in Thrace and laments his fate, but his father Apollo offers him a place among the gods
Characters	Orpheus, Apollo
Style	animations and dialogue
Music	Atto Quinto II
Specials	-
Status	updated dialogue

6. Future Work

6.1. Game Completion

Some parts of the game still contain placeholder graphics. The wedding dance would benefit from more variety of visuals for the dancing nymphs in addition to the lovers' dance animation which is currently very simplistic. The Styx scene and its music-sequence are still using placeholder backgrounds which need to be replaced with visuals for the river's in the underworld. To be able to detect any unknown bugs, it would also be beneficial to rigorously test the game and its mechanics to reduce the likelihood of game-breaking issues.

6.2. Evaluation

The next logical step for this serious game project would be to perform an evaluation to see how the improved game performs in effectiveness of conveying contents of *l'Orfeo's* story to visitors of an opera, in comparison to the old version and a traditional opera guide.

6.3. Additional Content

The game could still feature more additional content like optional items and NPCs, or potentially even optional scenes that the player can discover. These elements could teach more interesting tidbits about Greek mythology, allowing players to maybe learn more about the places featured in the world, or more facts about some of the characters present in the game. More additional optional content could transform it into a game which not just teaches the story of Orpheus and Eurydice, but also educates and fosters curiosity for the stories of Greek mythology.

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

7. Conclusion

In conclusion the Serious Game *Orpheus' Journey* originally designed and developed by Wargitsch [1] has been substantially improved, not just by completing missing elements, but also through additional content, gameplay mechanics and music which improve the overall experience. This could have a positive impact on the effectiveness of the serious game to convey the story and characters of the opera compared to the previous version and a follow-up study should be conducted to proof the validity of this statement.

Acknowledgments: We would like to thank our supervisor, David A. Plecher, for his guidance and advice throughout this project.

Abbreviations

The following abbreviations are used in this manuscript:

NPC Non Player Character

References

1. Wargitsch. *Orpheus' Journey - Using Serious Games to Prepare for an Opera Visit of Monteverdi's L'Orfeo* 2022.
2. Monteverdi, C.; Striggio, A.; Figueras, M.; Zanasi, F.; Savall, A.; Mingardo, S.; Savall, J. *L'orfeo*; Opus Arte, 2002.
3. Zentner, W.; Würz, A. *Reclams Opern- und Operettenführer*; Reclam, 1988.
4. Susi, T.; Johannesson, M.; Backlund, P. Serious games: An overview 2007.
5. Bégel, V.; Seilles, A.; Dalla Bella, S. Rhythm Workers: A music-based serious game for training rhythm skills. *Music & Science* 2018, 1, 2059204318794369.
6. Baratè, A.; Bergomi, M.G.; Ludovico, L.A. Development of serious games for music education. *Journal of e-Learning and Knowledge Society* 2013, 9.
7. Kim, H.S.; Oh, S.H.; Park, Y.H. Developing an educational game for art education-gesture recognition-based performance guidance for Mozart's opera magic flute. In Proceedings of the Learning and Collaboration Technologies: Second International Conference, LCT 2015, Held as Part of HCI International 2015, Los Angeles, CA, USA, August 2–7, 2015, Proceedings 1. Springer, 2015, pp. 573–582.
8. Amory, A.; Naicker, K.; Vincent, J.; Adams, C. The use of computer games as an educational tool: identification of appropriate game types and game elements. *British Journal of Educational Technology* 1999, 30, 311–321.
9. LucasArts. *Sam & Max*, 1993. Adventure Game.
10. LucasArts. *The Secret of Monkey Island*, 1990. Adventure Game.
11. LucasArts. *Grim Fandango*, 1998. Adventure Game.
12. LoPiccolo, G.; Harmonix.; RedOctane. *Guitar Hero*, 2005. Game [PlayStation 2].
13. Games, B.Y. *Crypt of the NecroDancer*, 2015. Rhythm Roguelike Game.
14. Monteverdi, C. *L'Orfeo*. <https://www.youtube.com/watch?v=jUep3sqe35o>. YouTube video. Accessed: 26-03-2024.
15. Mark, J.J. Ancient Greek Clothing. https://www.worldhistory.org/article/20/ancient-greek-clothing/#citation_info. World History Encyclopedia. Accessed: 26-03-2024.
16. Metal: Hellsinger. <https://www.metalhellsinger.com/>. Accessed: 26/03/2024.