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Sanni Mustonen[1]([✉]), Paananen Siiri[2], Colley Ashley[2], and Häkkilä Jonna[2]

[1] Lapland University of Applied Sciences, Rovaniemi, Finland
`sanni.mustonen@lapinamk.fi`
[2] University of Lapland, Rovaniemi, Finland

Abstract. We present the design process for historical characters in a video game based on the local cultural history of the town Kemijärvi, Finland. The characters represented real people living in the town during the time period. Through an expert evaluation with 4 history experts, challenges in, e.g. authenticity, ethics, and narrative creation, were identified. The work provides insights to researchers and practitioners working on the development of games based around the topic of local history.

Keywords: Cultural heritage · Game design · Character design · Animated characters · User experience · History

1 Introduction

Human-computer interaction research has a long history of presenting computer mediated experiences on cultural heritage (CH). Location-aware mobile applications, such as GUIDE (Cheverst et al. 2000) and Rexplorer (Ballagas et al. 2007), introduced local history to city visitors. The 3D modelling of CH sites, such as historical city centres (Debailleux et al. 2018), graveyards (Häkkilä et al. 2019), and archaeological sites (Rua and Alvito 2011), has given people a possibility to experience places which are located far away in distance or time. In parallel, the rise of the game industry has brought up an increasing number of entertainment-focused experiences set in historical contexts with imagined historical characters. Our research is interested in the design of historical game characters in a local town history-based game. We describe the design process of historical game characters, including the background research, design decisions, considering both historical and technical aspects. Finally, we present the evaluation of the character designs by history experts. As salient findings, we discuss the impact of portraying historically accurate 'real people' on the experience.

2 Related Work

A broad overview of the use of video games for CH education is presented by Mortara et al. (2014), who provide data on the learning effectiveness based on, e.g. the technology used, the context of use and the genre of the game. Through a review of commercial games employing historical content, Hanes and Stone (2018) categorize different

approaches, e.g. having either cognitive (factual) or affective focus. Metzger and Paxton (2016) categorize video games based on their approach to historical representation, e.g. antiquarian, critical, wishstory, borrowed authenticity, historical provenance, and legitimization. Against these frames, we aimed towards a factual antiquarian approach whilst engaging the game's player in affective interaction, through player engagement with the game characters.

Perhaps the most well-known historically based video game series is Assassin's Creed, an action-adventure combining historical fiction and fictional characters with real-world historical events and figures (Gilbert 2019, Politopoulos et al. 2019). Research has reported players theorized about the historical accuracy of the game which provided, e.g. "a sense of human connection to people in the past" and was able to influence players' beliefs about history (Gilbert 2019). More fundamentally, Politopoulos et al. (2019) question if history should be used as a 'playground', for what is fundamentally a violent video game.
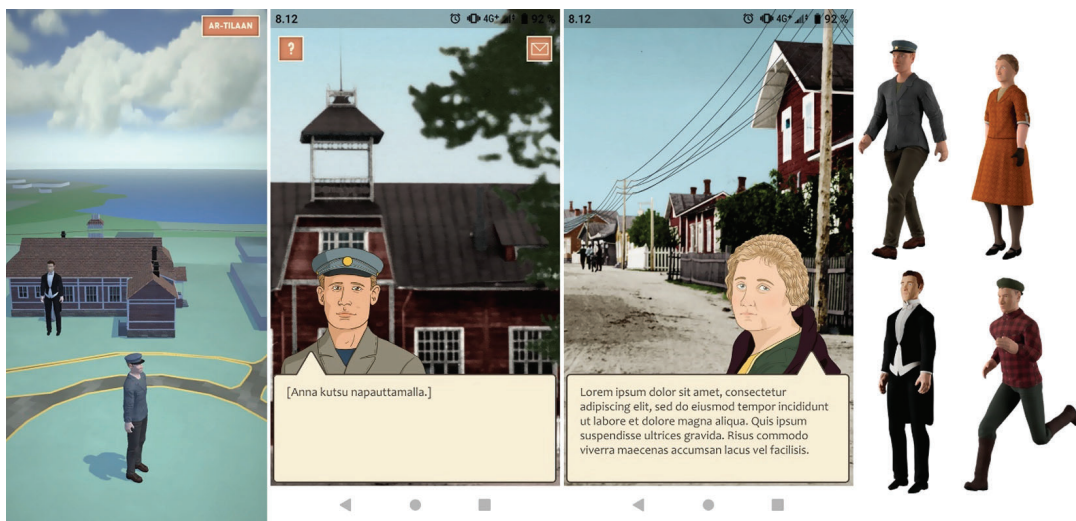

Fig. 1. Screenshots from the game. Left to right: Map view; Player character; Interacting with an NPC; The four characters in the game.

3   Location Based Historical Game

The game characters discussed in this paper formed part of a location-based historical game set in the town of Kemijärvi, Finland. The game is a singleplayer adventure mobile game following a similar format to the PokémonGO game (Colley et al. 2017), i.e. the player sees their own location on a map and must physically travel around the game area to complete tasks. The game places the player in the role of a postman delivering party invitations to non-player characters (NPCs). To progress in the game, the player is required to interact with each of the NPCs, while exploring the augmented reality world (Fig. 1).

The game was developed in conjunction with local municipal stakeholders to support historical tourism (Towner and Wall 1991) in the area. Aiming to present a historically

accurate picture, as well as online research, background research for the game included reviewing old materials held in the town's museum and interviews with local history experts.

Fig. 2. Design process for character of Lyyli Perunka

4   Character Design

The story of the game was set in Kemijärvi, Finland with a timeframe between the 1920s and 1950s.

4.1   Character Requirements

The general stylistic direction for the character visualizations was dictated by the game's platform: a mobile device with limited graphical processing power. For each character, 2D portraits for the dialogue view and 3D models for the map view were required (Fig. 1). Both formats had to be suitable for animation, e.g. facial animations for dialogue in 2D and loops for idling, walking and running in 3D.

A total of four characters were created, three of which (the NPCs) were based on real people, known to either live in or visit Kemijärvi during the selected timeframe. These people were suggested as characters by a local museum. The player character was an imaginary but period-appropriate postman. The three NPCs were based on:

- Lyyli Perunka, owner of her own fashion store.
- Erik Arppe, a magician and later also a barber.
- Aale Hakava, an artist who painted several altarpieces for churches in Finland.

4.2   Character Design Process

As background, source material for the characters was collected, which included photos of the people the characters were based on and general photos and drawings of clothing

and hairstyles in Finland at the time. All the photographic materials were black and white. Whilst information on fabric colours and patterns of the time was available from a central European or US perspective, little was available for Finland.

The 3D modelling of the characters was done by sculpting high-poly models in zBrush (https://pixologic.com/). The high-poly characters were then remeshed and decimated to suit for animation and mobile device performance. The low-poly versions were then UV-mapped in Blender and textured in Substance Painter.

4.3   Historical Detail and Compromise

In the character design process, the designer needed to fill blanks left by the limited photographic material, e.g. for the character Aale, only a single adult photograph was available. Although the image quality was good, the face was not fully visible, and had a squinting expression. Modelling the hairstyle of the character Lyyli presented several challenges, e.g. the few photos of her with her hair up were studio photos and hence did not show the hairstyle from behind. As this was also true of other photos of the time, the design of Lyyli's hair was modelled following a set of instructions from the period on how to create the hairstyle (Fig. 2). The loose time setting of the game made it challenging to design Lyyli's outfit, as women's fashion went through many phases during the first half of the 20th century. This was compounded by Lyyli's profession as a fashion store owner. Hence, a knee-length skirt was selected as being appropriate for the whole timeframe of the game, with colour choices according to fashion imported from outside Finland.

5   Expert Evaluation

Prior work has highlighted challenges in the design of historical video games, e.g. related to authenticity and the need to consider ethical aspects (Hanes and Stone 2018, Metzger and Paxton 2016). To understand these issues in the scope of our local history game, we conducted semi-structured interviews with four history experts. As the game could only be played in the Kemijärvi location, the evaluation was based only on screenshots and animations from the game.

5.1   Evaluation Set-Up

After providing informed consent, participants were asked to discuss their experiences of historical fiction in general, including all kinds of media, such as books and movies. Participants were prompted to provide memorable examples and to highlight positive and negative issues. The interview then focused on history themed video games and used probe materials from the Kemijärvi game and its development, e.g. Figs. 1 and 2. After a general introduction to the game and its characters, discussion focused on the central character of Lyyli Perunka. Participants were shown reference photographs and source materials on which her character design was based, the game artist's working sketches, and the final 2D illustration and 3D model of the game character. Based on this, they

were asked their opinion on this approach of designing a game character based on a real person, their views on the process and outcome.

Aiming to gain diverse viewpoints, four experts from different disciplines of the history field were recruited, specializing in art history (P1), archives (P3), history education (P4) and folklore (P2). The experts (3 female), were between 39 and 66 years of age. All had some experience of video games, either from playing themselves (P2, P3, P4) or watching their children play (P1, P4). The interviews were audio recorded and each took approx. 30 min. Participants were compensated with a €12 gift card.

5.2   Evaluation Results

The audio recordings were analysed by two researchers working together. An affinity diagram was created, from which common themes were extracted. The themes addressed the general content of historical video games, the balance between fact and fiction, ethical concerns and the importance of the design process.

5.2.1   Historical Video Games

In general, all the experts felt positively about history themed games, and wished for more related projects in this field. Participant 1 (P1) was particularly positive about the depiction of the old town, and how people used to live, but cautioned that it should not be considered entirely factual, *"I do think it can increase people's interest [in history], as long as they remember that it is fiction"* (P1). One participant stated that using real people as characters makes the player pay closer attention to the content (P4).

5.2.2   Balancing Fact and Fiction

Three of the participants (P1, P3, P4) were concerned that, over time, a fictional piece of work could become the 'real' story, and the line between truth and fiction may become hazy. Some of the experts wished for clear disclaimers of what parts of the story are real and what are fictional (P1, P3), while one placed the responsibility on the player, emphasizing the importance of history education as a basis for the ability to distinguish fact from fiction (P4).

The visual appearance of characters and environment was seen as important and having a significant impact on the impressions left by historical fiction. One of the experts stated that especially the visual elements need to be accurate and authentic, *"That what you see, what is visual, is important to get right"* (P4). Explaining that incorrect impressions are difficult to change later, and artistic freedoms are more acceptable with stories and characters' personalities than in their appearance (P4). Another expert stated that the visualization of the characters or the environment is not necessarily enough to keep the player interested, and other means are needed to maintain player engagement (P2).

5.2.3   The Character Design Process

All the participants mentioned that good background research is critical when developing historical fiction, especially when using real characters. The experts expressed that it can

be done using internet, archives or museums, while remembering to be critical of the source material. One participant mentioned how pictorial sources are important, and it was suggested that besides photographs, old paintings are a good source for visual information (P1). Two of the participants (P1, P2) suggested using old magazines to find information on clothing and hairstyles from the game's period, as well as on the discussion topics of the time. All the experts considered the game characters' appearance to be period-appropriate. They particularly appreciated the background research that went into Lyyli, which was presented as an example (P1, P3). *"I think this [character] is quite believable"* (P1). The characters' visual appearance potentially created misleading first-impressions, e.g. three participants mistook the magician Erik for a nobleman, banker, or someone with power and were surprised to hear he was a magician (P2, P3, P4). The fact that the player character was fictional and not based on a real person was considered positively, as it leaves space for the player's own imagination (P3, P4). It was thought even better if the player could select and customize the character (P1, P3, P4).

5.2.4   Ethical Concerns

The experts noted the need for sensitivity when working with recent history, as close relatives of the people portrayed in a game may still be alive, and recommended asking permission from relatives (P1, P4). It was also noted that game developers should pay attention to stereotypes, power dynamics or gender roles conveyed by the characters. These are not only present in the characters' appearance but also in their actions, *"One needs to be mindful of what kind of character they are designing. It's sad if we transfer stereotypical models of women's and men's roles to children without any criticism"* (P2).

6   Discussion and Conclusion

A key aspect, separating our work from the majority of prior work, is its location-based nature and use of game characters based on real people from recent history. Existing research has explored player's emotional attachment to NPCs, highlighting the virtual characters' levels of physical attraction, friendliness and usefulness in the game as key parameters (Coulson et al. 2012). Coulson et al. (2012) identify 'realism' as a factor that makes video game characters believable and likeable referring primarily to the rendering quality of the characters. However, our work suggests that the use of characters based on real (deceased) people, can also influence the player's engagement with the game characters, i.e. contributing to the affective elements in Hanes and Stone's (2018) model.

Whilst we expected criticism of our use of real characters, e.g. as grasping for 'borrowed authenticity' or 'legitimization' (Metzger and Paxton 2016) this was not forthcoming. Clearly the experts primary demand was for historical accuracy above all, e.g. not favouring our blending across several decades. One exception to this is the player character, through which the player experiences the virtual world. In this respect our interviewees highlighted the desire for customization, enhancing the player's feeling of presence within the virtual game world.

Much of the feedback provided by our history experts emphasized the importance of the background research phase in the character design process. In our game, focus was

clearly on historical authenticity, and, as a consequence, other areas were less developed, e.g. using the same armature and animations for all characters. As the available information on historical characters is limited, artistic input is required to create a complete game character, 3D modelled and fully outfitted. Here our use of a sculpting based modelling tool (zBrush) influenced our resulting character visualizations, e.g. compared to photogrammetry or parametric modelling. We note reflections from film industry, where it is acknowledged that even 'historically accurate' costumes are, in fact, re-interpreted though the modern-day designer's eyes (CostumersGuide n.d.).

The experts raised several ethical concerns about our game implementation. As the portrayed characters' relatives may still be alive, it was questioned how they would feel about such portrayals and what kind of permissions would be required. Other ethical issues noted the potential of video game characterizations to transfer negative stereotypes, e.g. through the chosen visual elements such as outfit, hairstyle, age and gender. This topic has been addressed in detail by Haake and Gulz (2008) in the scope of educational games.

We believe our work provides future researchers and game designers with insights into where to focus time and resources when developing historical video games. We highlight the importance of background research to gain historical accuracy, and the potential benefits and challenges of including game characters based on real deceased individuals.

References

Ballagas, R.A., et al.: Rexplorer: a mobile, pervasive spellcasting game for tourists. In: CHI 2007 Extended Abstracts on Human Factors in Computing Systems, pp. 1929–1934. ACM (2007). https://doi.org/10.1145/1240866.1240927

Cheverst, K., Davies, N., Mitchell, K., Friday, A.: Experiences of developing and deploying a context-aware tourist guide: the guide project. In: Proceedings of the 6th Annual International Conference on Mobile Computing and Networking, pp. 20–31 ACM (2000). https://doi.org/10.1145/345910.345916

Colley, A., et al.: The geography of Pokémon GO: beneficial and problematic effects on places and movement. In: Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems, pp. 1179–1192 (2017). https://doi.org/10.1145/3025453.3025495

CostumersGuide (n.d). http://www.costumersguide.com/design.shtml. Accessed 10 June 2021

Coulson, M., Barnett, J., Ferguson, C.J., Gould, R. L.: Real feelings for virtual people: emotional attachments and interpersonal attraction in video games. Psychol. Popular Media Culture **1**(3), 176 (2012). https://doi.org/10.1037/a0028192

Debailleux, L., Hismans, G., Duroisin, N.: Exploring cultural heritage using virtual reality. In: Ioannides, M. (ed.) Digital cultural heritage. LNCS, vol. 10605, pp. 289–303. Springer, Cham (2018). https://doi.org/10.1007/978-3-319-75826-8_24

Gilbert, L.: Assassin's Creed reminds us that history is human experience: students' senses of empathy while playing a narrative video game. Theory Res. Soc. Educ. **47**(1), 108–137 (2019). https://doi.org/10.1080/00933104.2018.1560713

Haake, M., Gulz, A.: Visual stereotypes and virtual pedagogical agents. J. Educ. Technol. Soc. **11**(4), 1–15 (2008)

Häkkilä, J., et al.: Visiting a virtual graveyard - designing virtual reality cultural heritage experiences. In: Proceedings of MUM 2019:18th International Conference on Mobile and Ubiquitous Multimedia (MUM2019), 26–29 November 2019, 5 p. ACM, New York, NY, USA, Pisa, Italy (2019). https://doi.org/10.1145/3365610.3368425

Hanes, L., Stone, R.: A model of heritage content to support the design and analysis of video games for history education. J. Comput. Educ. **6**(4), 587–612 (2018). https://doi.org/10.1007/s40692-018-0120-2

Metzger, S.A., Paxton, R.J.: Gaming history: a framework for what video games teach about the past. Theory Res. Soc. Educ. **44**(4), 532–564 (2016). https://doi.org/10.1080/00933104.2016.1208596

Mortara, M., Catalano, C.E., Bellotti, F., Fiucci, G., Houry-Panchetti, M., Petridis, P.: Learning cultural heritage by serious games. J. Cult. Herit. **15**(3), 318–325 (2014). https://doi.org/10.1016/j.culher.2013.04.004

Politopoulos, A., Mol, A.A., Boom, K.H., Ariese, C.E.: "history is our playground": action and authenticity in assassin's creed: Odyssey. Adv. Archaeol. Pract. **7**(3), 317–323 (2019). https://doi.org/10.1017/aap.2019.30

Rua, H., Alvito, P.: Living the past: 3d models, virtual reality and game engines as tools for supporting archaeology and the reconstruction of cultural heritage–the case-study of the roman villa of casal de freiria. J. Archaeol. Sci. **38**(12), 3296–3308 (2011). https://doi.org/10.1016/j.jas.2011.07.015

Towner, J., Wall, G.: History and tourism. Ann. Tour. Res. **18**(1), 71–84 (1991). https://doi.org/10.1016/0160-7383(91)90040-I