Making Immersive Media Environments Accessible: The Immersive Accessibility Project

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Abstract

The goal of Immersive Accessibility (ImAc), which has been funded by the EU in the frame of the H2020 programme, is to explore how accessibility services can be integrated with immersive media. This article will describe the new deployment methods for these accessibility services: Subtitles, Audio Description, Audio Subtitling, Sign Language in immersive environments.

1 Introduction

The European Commission has a clear policy towards media accessibility. It is framed within the United Nations Convention on the Rights of Persons with Disabilities[42] (CRPD). The CRPD is the fundamental instrument and sets the context worldwide from where to develop accessibility plans and strategies. CRPD is legally binding and sets minimum standards for the rights of people with disabilities. It is the first human rights convention having the European Union as a party. The Council of the European Union (EU) adopted the Decision for the conclusion of the Convention [43] on 26 November 2009. For the EU, the CRPD entered into force on 22 January 2011. This means that nowadays all the EU countries have signed the Convention. There is also an Optional Protocol which out of the 27 EU countries 23 have also signed, and 21 have ratified[44].

The CRPD aims to guarantee that people with disabilities can enjoy their rights on an equal basis with all other citizens, and it sets out minimum requirements for safeguarding a full range of civil, political, social, and economic rights. The convention reflects the EU commitment to building a barrier-free Europe for the estimated 80 million people with disabilities that will live in the EU in 2020, as set out in the European Commission disability strategy[45], which in the case of media also joins the European Digital Single Market[46].

This is especially evident in a multilingual Europe, where 100% of EU residents require translation (or language accessibility) at one point. As a result of these policies funding for media accessibility in Europe in broadcast has had a proactive approach. When Europe was changing from analogue to digital TV the EC funded DTV4ALL [47], to secure accessibility services in the new digital format. Years later Europe has developed its own broadcast standard for both broadcast and broadband named HbbTV. Accordingly the EC funded the project HBB4ALL [48] to secure mature accessibility solutions in the new hybrid and connected broadcast scenario.

The new immersive media context and its mainly application for learning also posed a challenge to accessibility. ImAc[49] was funded by EC to establish accessibility solutions in this new media format.

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[42] https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html

[43] https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html

[44] http://europa.eu/rapid/press-release_IP-11-4_en.htm

[45] http://europa.eu/rapid/press-release_IP-10-1505_en.htm?locale=en

[46] https://ec.europa.eu/digital-single-market/en/policies/shaping-digital-single-market

[47] http://www.psp-dtv4all.org

[48] http://pagines.uab.cat/hbb4all/

[49] http://www.imac-project.eu

2 The challenge

ImAc decided to move away from the constraints of the current technology, into a hyper-personalized environment where the consumer can fully customize the experience to meet his personal needs (Mas and Orero forthcoming).

The key action in ImAc is to ensure immersive experiences are inclusive across different languages, addressing the needs of those with hearing and vision loss, learning difficulties and the aged.

The project departed to solve expected challenges (Agulló and Orero 2017), such as designing accessibility editors for 360º content (subtitling editor, audio description editor, sign language editor and accessibility content manager) or how to signal speaker directionality in subtitling or sign language interpreting (Montagud et al. 2018 a, 2018b, Agulló et al. forthcoming).

3 Immersive subtitles

This project is also looking at how the end user will access the content. This was not taken into consideration in previous projects such as DTV4ALL or HBB4ALL that focused only in the accessibility to media content, disregarding how the end user would access it.

Designing a user interface was one of the first tasks, and to this aim the icon shown in Figure 1 in the red square was used.

Figure 1. Icon for user interface.

The next screen is the menu with all the possibilities on offer to define accessibility features, as can be seen in Figure 2: Languages, Easy to Read, Position, Background, Size, indicator and Area.

Figure 2. Hyper personalization menu options.

Then the player itself had to be designed with icons which are standard as in Figure 3 icon for play.
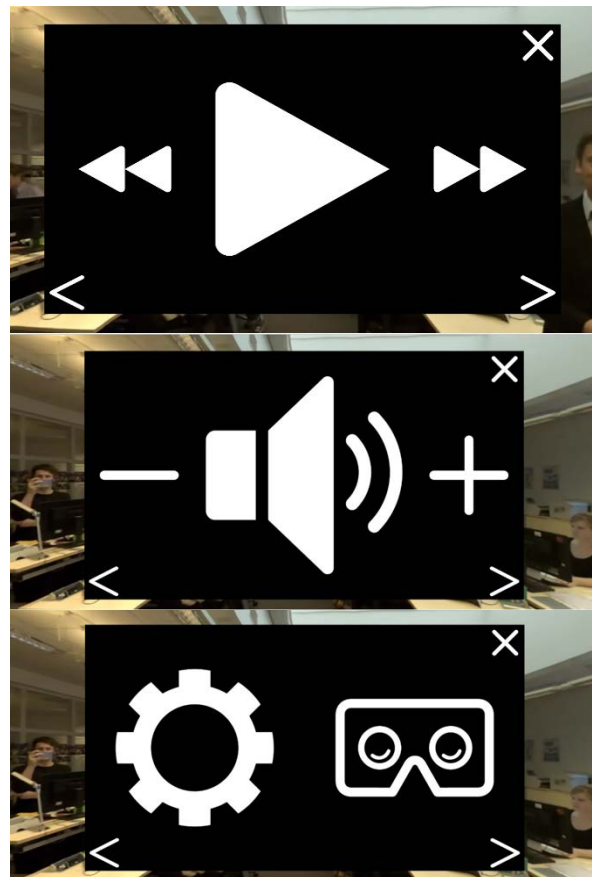

Figure 3. Icons for the player.

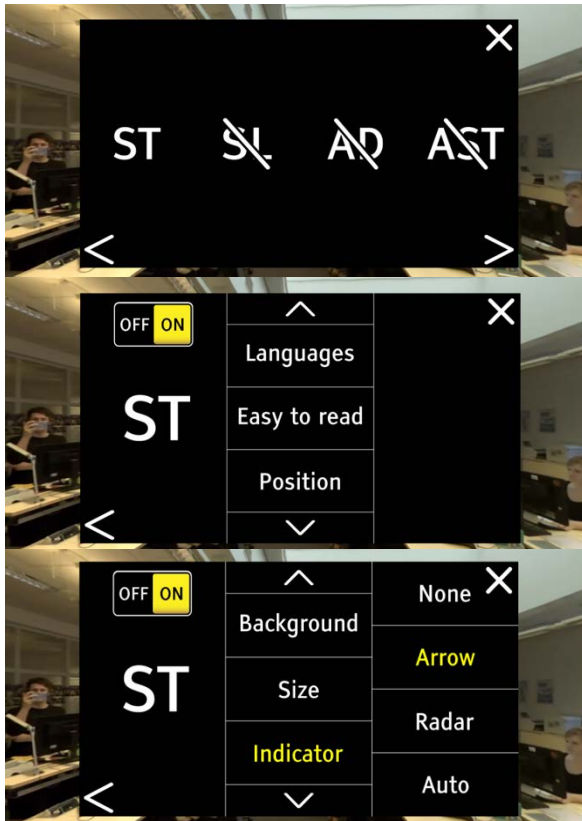And new ways of interaction such as those in Figure 4 for services.

Figure 4. Menu for services.

It was also important to design the presentation modes for guiding the end user towards the speaker, as can be seen in Figure 5, with an arrow, or with a compass.

Figure 5. Icons for presentation modes.

All the above user interaction possibilities have been designed following a bottom up approach. This is performing focus groups with end users who defined the best way. These presentation modes will now be piloted towards finding the best solution.

4   Omnidireccional Audio Description

Audio description in 360º media presented new challenges also. What was not expected was the effect of 360º sound possibilities on audio description (AD) (Bernabé and Orero forthcoming, Fydika and Matamala forthcoming). This opened the door to new AD writing styles depending on the type of sound used (Orero et al forthcoming). Three options have been defined. The first is what has been defined by Orero et al (ibid) as "Voice of god", that is when the sound source surrounds the listener. The second possibility, allowed by sound object technology, is to locate the sound to the place where the action is taking place. In this case the AD is enriched by the information offered by the sound location and direction, and this is reflected in the AD script. Finally, another immersive AD possibility is the one where you can have the AD delivered related to the consumer enjoying the content. In this case the AD is drafted as if it was someone speaking to the end user, and in relation to the end user dynamic position.

ImAc has now finished defining the accessibility features to be developed for the services: subtitling, audio description, sign languages, and audio subtitling. System and technology requirements have been drawn following a user centered approach (Matamala et al. 2018), in which users have been consulted through a series of focus groups and one-to-one interviews.

The current step in the project is a pilot in which the actual developments, in their first iteration, are implemented in different types of content and are tested by end users using the ImAc accessible player. Two types of users will be involved in the testing: on the one hand, professionals testing the production tools and, on the other, end users testing the actual accessibility services and the interface that gives access to the accessibility services.

5   Conclusions

ImAc aims to research accessibility services in immersive environments putting the users at the center of the research design and considering accessibility as part of the process. Accessibility should not be regarded as an afterthought: rather it should be considered throughout the design, production and delivery process, and this is the approach that the ImAc project has taken.

Credits

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