
Design of an Application for Collaboration and Interaction with Animated Content for Children in a Television Ecosystem

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Abstract

The ongoing research project presented in this paper aims to propose and evaluate models of interaction with audiovisual animated content in an interactive television ecosystem. Through the referred models we aim to understand the extent to which an interactive animation application can encourage the shared participation of children at primary school level in taking an active role while watching TV animation. Here we present the conceptual and empirical methodology adopted to develop the research work and the current state of research.

Author Keywords

Animation; Interaction; Collaboration; Interactive TV

ACM Classification Keywords

J.4 Social and Behavioral Sciences. D.2.2 Design Tools and Techniques: User interfaces; D.4.7 Organization and Design: Interactive systems; H.5.1 Information interfaces and presentation (e.g., HCI): Multimedia Information Systems; H.5.m. Information interfaces and presentation (e.g., HCI): Evaluation/methodology

Introduction

Animation has been a popular audiovisual product for communicating with, educating and entertaining children who watch television and is still the type of content that younger children consume the most (HUSTON et al., 2007, PEREIRA, et al., 2009). However, TV consumption has evolved from being a collective and family activity to a more individual and fragmented experience. This is caused by the last decade's proliferation of TV sets in each family home and the fragmentation of children's attention among several digital devices like personal computers, mobile phones and video game consoles (GAUNTLETT and HILL, 1999, p. 288, HUSTON et al., 2007). The possibility of asynchronous consumption and the use of second screens (for either multitasking or supporting the TV interaction) has enabled a more convenient, more personalised experience of TV, but at the same time reduced the shared consumption which was common when people watched live broadcasts together.

The tendency for this type of behaviour in TV consumption has grown and happens in lower ages groups, as well, though it is more frequent among teenagers, who have easier access to more devices. In general, video consumption is mostly individual, although it can also be a shared social behaviour. On the other hand, specific types of content can be exclusively individual, like in the case of news (Oksman et al 2007). This might suggest that the type of content influences consumption behaviours. 'Videos are accessed and played to show other people while socializing'. People can share a video to share an emotion that was provoked by watching that video previously (McNally 2017).

People are more connected than ever but at the same time tend to not experience the same things together in the same way. People often 'watch video on their own as a way to spend time with others even though they were not partaking in the same activity' or 'watch on their smartphone while those they wanted to spend time with also watched video, but on a different device' (McNally 2017).

Research questions and goals

These realities bring us to some questions in the crossroads between personal and collective consumption. How can multiple devices and the interactive potential of TV be used to reduce isolated and fragmented consumption and increase social interaction among viewers? How can we increase effective shared consumption, specifically in younger children, without breaking the advantages of individual consumption? Is the possibility of interacting and creating animation around audiovisual content on various platforms considered by children as an advantage compared with passive viewing of audiovisual content?

Our main goals are to understand to what extent an interactive animation application (for iTV) can encourage the involvement of children in the unfolding of an interactive animated visual product and encourage more active social behaviour in children's television consumption.

Methodology and current work

This text aims to describe the theoretical and methodological lines of approach to our research and investigate the interactive potential of animated television that only recently has been explored at a

more widespread level with Netflix's recent contributions to this type of product – the cases of *Puss in Book: Trapped in an Epic Tale* (2017), *Buddy Thunderstruck: The Maybe Pile* (2017), and *Stretch Armstrong and the Flex Fighter – Breakout* (2019).

To achieve this, three models of interaction with animation are proposed and will be tested empirically. During various stages of contact with a sample group, we intend to test and validate the interaction model that allows us to best address the research questions.

The three conceptual models of interaction referred are used in other contexts of digital media but haven't been consistently explored in animation in iTV. In further stages we will empirically validate these models, and if none is efficient, features from each will be combined to form a mixed model that meets the objectives proposed. From the conceptualized models, we are starting to develop three low-fidelity prototypes, oriented to test and validate one of the referred conceptual models.

This study being conducted is divided into several stages, from a broad research of the field of study and developing and animating prototypes to collecting and analysing data. In a general manner, we describe below the phases of the investigation, first the ones that have already been concluded and then the ones following in the near future.

The first phase was an exploratory one, based on finding bibliographic references and literature reviews and writing a state-of-the-art to better understand the areas we are investigating.

The field of study in general comprises the universe of Portuguese children who are consumers of animation in television. In Portugal, this universe is between 3 and 16 years. Given the extent of the universe of study, our option was to build the sample within the age group of children at the primary school level. The sample group includes participants of both genders in similar numbers when possible. The capabilities and interests of children affect their choices and options for dynamic content in TV, so for future research we're considering comparing data with schools within different socio-economic contexts.

We made contact and dealt with the bureaucracy of institutional cooperation between the university that hosts the PhD candidate's research and the school district where the primary school that hosts the sample group of children is located. Still in this phase, the sample group went through a series of short creative activities with participant observation by the researcher and was subjected to an interview survey containing questions complemented with visual support. The main objective was to obtain information about their digital literacy and interests in animation.

In the current phase we first shaped the three models of interaction with animation; based on those, we are now shaping three possible prototypes with which the children will be able to interact. All three allow both viewing during a broadcast and asynchronous consumption. One of the possibilities for creating a context for the two types of consumption is setting up something like a 'game room', where the child could arrive and interact with an animation or see the animation that their friends or siblings had seen/interacted with before. The interaction by the

previous viewer can condition the current viewer's experience depending on the model used.

We will now introduce the three approaches that support the development of the prototypes.

Interactive storytelling

This is a common model in other media and is starting to be used more frequently in TV content as well. Its use is still limited by interaction devices (TV remotes) and has still only been used in existing cartoons and in single-episode experiments. The model we aim to test is based on interaction with the narrative, and though some approaches like this already exist, we aim to obtain some valuable information on how they can be improved through using completely original content and allowing more than one child to interact with it. Interpersonal communication that involves the exchange of comments among themselves and votes on individual and collective actions can dynamically contribute to manipulating choices and directions in the narrative and influence the perception of the audiovisual content. This could be done through audio or messaging and can work differently depending on whether it is simultaneous or based on hints that the children leave each other. In this interaction model, each narrative block is independent and autonomous and it's in transition moments between blocks that these collective choices are relevant for determining the sequence of events and the outcome of the story. In summary, the users do not have total freedom to build a story from scratch; instead, they're able to connect the segments of previously constructed narratives so they can set their own history. Collective options decided on by a group of children would allow only one

combination of narratives, with a narrative arc understandable by all.

Customising visuals and layers

The second option for a model focuses on interaction through direct action on visual content. This option is participatory and built up through layers on pre-defined animation blocks. Visual information can be added onto a visual object which is customizable and in a certain way functions as an avatar. A child could see himself or herself as a character, superimposed over the animation, and his or her friends as characters, side by side with the heroes, or even replacing them. It is intended that they could also participate, launching or manipulating objects (using a second screen as interaction device), participating with other children in the visible action at key moments of the narrative. This model is based on direct intervention in the audiovisual content while watching and demands more of a constant participation from the viewers. One way to achieve this is to introduce 'game-like features' and analyse whether they are a valid way to improve audiovisual content.

Individual conditioning of collective interaction

In this model, children could act and make options that condition their own and other children's experience of watching the animation. Their choices about characters and their features would condition the narrative. If they opt for a very tall character, for example, they might not be able to enter some door; on the other hand, they might be able to reach objects that other characters can't. As the consumption can be asynchronous, their choices might condition or amplify other children's viewing experiences – by unlocking a

previously closed door or taking the only boat available, for example.

Future work and expected outcomes

Currently we are addressing the best way to build the prototypes while making them feel like real interactive animation. Initially the testing was going to be done in school during holidays while the kids are involved in activity workshops, but currently we are narrowing down the sample so we can do field tests in their own houses. This will avoid some bureaucratic blockades and increase the feasibility of the results, as the sample group would be interacting with the content in their

The participants in the sample group will test the low-fidelity prototypes. During the trial, each child will be supervised by a parent and a non-participant observation researcher, and the child's interaction will be evaluated in quantitative and qualitative measures. After this activity, the children will be interviewed in order to obtain more detailed information about their participation.

Following this, the conclusions will be drawn regarding which of the prototypes is the most efficient in terms of flow (continuous or needs intermediate support), consciousness of social interaction (how the feeling of presence of friends or siblings contributes to the consumption) and enjoyment of animated content (whether the viewers enjoyed the model of interaction). From the results obtained, we will propose a final, evolved model that will more accurately meet the objectives of this study.

usual environment of consumption. The prototypes are going to be developed as web apps and presented on a computer connected to a TV rather than a set-up box.

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