
Evaluating Immersion and Time Perception in Digital Games

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Abstract

Immersion is a commonly reported phenomenon amongst gamers, designers and reviewers of games. One of the consequences from immersion is losing track of time. Studies on time perception in digital games show players underestimate time whilst playing digital games. That being said, however, little has been done to investigate whether immersion alters player's perception of time or not. Therefore, our research aims to investigate the relationship between immersion and time perception. The results from our research could give an insight on the overall gaming experience especially on player's time perception. Moreover, it helps to understand why players play digital games for long time, addiction in games and obsessive behaviour, amongst others!

Author Keywords

Immersion; Time Perception; Attention

ACM Classification Keywords

H.1.2 [User machine systems: Human information processing]: Games.

General Terms

Experimentation

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Introduction

The experiences of playing digital games are vary and it depends on the gamers' descriptions. The lack of fine-grained method to evaluate the experience makes the process to identify the experience more difficult [1]. However, terms such as flow, fun, playability and immersion amongst others are often used to describe the experience one's achieved whilst playing digital games [1],[7],[4]. The rich variety of such experience and the inter-play between them makes it challenging to identify the factor that influence gaming activities which leads to the positive gaming experience. That being said, however, our research focuses on one factor, one that is commonly reported phenomenon among the gaming community including gamers, designers and reviewers of games, namely immersion in playing digital games [4]. We are interested to investigate the relationship between immersion and time perception in digital games.

Immersion in Digital Games

Immersion is a phenomenon that colloquially is understood to be the sense of being "in game" where players invest all of their attention, thoughts and goals all in the games as opposed to their surroundings [15]. It represents the level of engagement with the games. Consisting of three levels namely engagement, engrossment and total immersion, immersion is defined as a graded experience. It allows gamers to describe the experience as less immerse or having a total immersive experience whilst they are playing digital games [12]. Its consequences including loss track of time, less aware of the surroundings and become more involve with the games as the games is the only matter [10].

Considering studies done before on the factors that influence immersion, several researches have been

conducted to investigate the effect of touch-screen size [17], behaviour and realism [6], immersion and addiction [16], amongst others but little have covered either immersion does affecting player's perception of time or not. The aim of our research is to investigate player's time perception while being immersed in the game.

Time Perception in Digital Games

The famous psychologist William James divides time perception into two paradigms namely prospective paradigm and retrospective paradigm [11]. Prospective paradigm is a judgement where a person is aware with the need to estimate time before they experience the time duration while retrospective paradigm is a judgement where a person is unaware with the need to estimate time until the duration of period has passed and later they have to estimate the time duration. [3] add prospective paradigm require attention whereas retrospective paradigm requires memory in estimating the time. [2] found that these two paradigms have different processes where in a specific event one is more affected compare to another.

In the digital games area, the complexity of the method to estimate the playing time makes it challenging to pick out what exactly is happening to players perception of time. Several studies on players time estimation have been conducted and they found that players generally underestimated time whilst playing digital games [18], [14]. They also found there is no significant difference between their time duration judgement and the correct time. That being said, however, in their researches they didn't explicitly mention which paradigm they have followed in measuring the time estimation. Thus, it leaves with a lot of enquiries on which paradigm should be followed.

Also, recent study on immersion and time perception in digital games used music to alter immersion experience [15]. Music was used in the study to make the game more immersive and time perception is measured using both retrospective and prospective paradigms of duration judgement. From the study, it is established that increased immersion in a videogame alters time perception as duration is underestimated in the prospective paradigm where music is added to the players experience. However, immersion for each of the players would have depended on if they liked the music or not and therefore couldnt have been altered uniformly.

Challenges in Conducting This Research

The differences of the methodology in evaluating immersion and time perception suggest that these methods produce results differently. The confusion on conducting research in time perception arises when different fields of research treat time perception differently [9]. For example, neuroscientists argue that different parts of brain produce different ways on how human perceive time, physicists look at time objectively as space and last but not least psychologists treat time perception as subjective experience as how people experience time. However, no unified theory has concluded an appropriate method to conduct research in time perception.

The same problem appears in the research of immersion in digital games. Some researchers divides immersion into several groups namely sensory, challenge-based, and imaginative immersion [8]. They argue that all games consist of these three type of immersions but one of them has the strongest affect. Recent study found that immersion leads to incorporation which intergrate the environment into conciousness and thus being incorporated as an avatar [5]. This incorporation consists

of six dimensions namely kinesthetic, spatial, narrative, shared, affective (emotional) and ludic involvement. Immersion is argue to move between these dimension.

However, for measuring immersion, we apply the Immersive Experience Questionnaire (IEQ). It was used to sum the scores of the immersive experience [12]. We argue that, instead of treating immersion differently we measure immersion as a graded experience. This questionnaire consists of 31 questions with 5-points Likert scale. It was developed based on five components of immersion namely cognitive involvement, emotional involvement, real world disassociation, challenge and control. To measure immersion, participants will be asked to play games and at the end of the session they have to answer this questionnaire. It is quite straightforward in measuring it.

The level of immersion increases as the game develops. This therefore involves time especially for gamers to go through all phases in immersion. Short period of gaming session is usually impossible to allow gamers to enter the total immersion stage. The challenges we are facing at the moment are as follow:

- How long should we ask participants to play the game in the experiment?
- Which method is appropriate to measure time perception whilst playing digital games?
- How do we understand the translation of the experienced time into the objective statement of time on the paper?
- How do we manipulate immersion without changing the cognitive processes that a priori could affect time perception?

Conclusion

We hope the organiser would invite us to participate in the workshop as we could share our experiences conducting this research. We have conducted several experiments and we would like to share the outcomes and gather information to overcome the challenges.

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