Augmented Tabletop Role-Playing Game with Movement-Based Gameplay and Arm-Worn Devices

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Abstract
Augmenting table-top role-playing games (TTRPG) is a trending subject in game research. Different objects and interaction modalities such as surface displays, tangible devices or interactive rooms are used for the augmentation of TTRPG. Still, usage of wearable devices and movement-based gameplay in such games is a rather underexplored area although they have a potential for enhancing the player experience according to the previous studies. To delve into this area, we developed a new interactive environment comprised of arm-worn devices and an augmented die. These devices, together with a new role-playing game system, facilitate movement-based gameplay which encourage players to enact their characters with their bodies. In this paper, we explained the specifications of this gaming environment and our demonstration setting.

Author Keywords
Wearable Computing; Role-Playing Games; TTRPG, PnPRPG, Pen-and-Paper, Tabletop Games, Board Games, Tangible Interaction, Augmented Games

ACM Classification Keywords
H.5.2 Evaluation/methodology - Input devices and strategies - Interaction styles

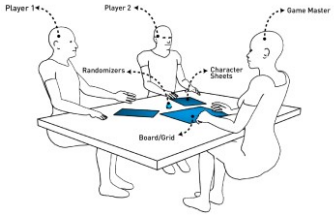

Figure 1: Tabletop role-playing setting

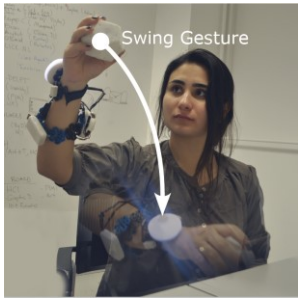

Figure 2: Power Mini-Game

Introduction

Tabletop Role-Playing Games (TTRPG) are games in which players assume the role of their fictional character. Game consists two types of actors which are players and the game master (Figure 1). Players role-play their characters by controlling them according to the game events which takes place in an imaginary world written and moderated by the game master. TTRPG can include supportive objects like dice, character sheets, boards or figures. Conventional setting of TTRPG does not include digital artifacts. Nevertheless, recent studies integrate computer assisted devices such as notebook computers, interactive boards or surrounding systems like interactive rooms into role-playing games for altering especially narrative, ludic and functional properties [1,8]. However, a gaming environment comprised of wearable devices in the context of TTRPG was not investigated before.

Although wearable devices were not used in TTRPG before, this technology was adopted by live-action role-playing (LARP), pervasive and physical games. They are considered useful for such gaming environments [7], since wearables were speculated to be devices to which "calm technology" principles can be applied [13]. Remaining in the periphery, wearables do not distract players, allowing them to focus on the game and maintain their social interaction. These two qualities are important aspects of TTRPG. Previous studies also indicate that wearable devices increase the connectedness to fictional worlds -which is critical for TTRPG- by being perceived as costumes [6,11]. Apart from these, sensors embedded into wearables may create opportunities for embodied interaction where players freely interact with the game by using their whole bodies instead of focusing on displays or controllers [9]. Previous studies indicate that movement-based gameplay may increase players' motivation and identification feelings towards the imaginary characters in role-playing games [2]. Still, although user-oriented design implications for such gaming environments are present in the field [2,3], how these implications may turn into a working prototype was not explored.

In the direction of these arguments, we believe that an environment comprised of wearable devices and movement-based gameplay may enhance the TTRPG experience. Therefore, we developed a table-top gaming environment which facilitates embodied interaction with the help of arm-worn devices and an augmented die based on the previous work in the field. In this paper, we explain our gaming environment and our design motivations behind it.

Game System

Recent studies about TTRPG and wearables indicate that (Concept1*) tangible interaction*, (C2*) automatization of uncaptivating processes*, (C3) *non-distracting interaction techniques*, (C4) *customization depending on the fictional character* and (C5) *movement-based gameplay* can be preferable by players [2].

In the light of this information, we designed a new RPG system. This system is based on a fictional world where five elements of water, air, earth, fire and electric grant powers to the fictional characters. Players choose two of these elements to define the main attributes of their characters. The game play session, different from many conventional RPGs, is operated by seven different

Figure 3: Fire and Water stones are attached to the device

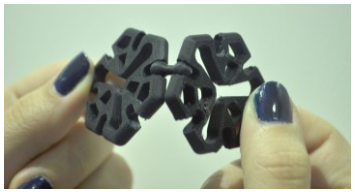

Figure 5: Hexagonal Parts and Two Different Design Alternatives

movement-based mini games (C5). For example, in power mini-game (Figure 4), players must swing their arms as strong as possible if they want to perform a strength-related move. Players play these games with *Elemental Gauntlet* (EG) which is an arm-worn device with capabilities of motion tracking, haptic and visual feedback and wireless communication (Figure 6 and 7). Game is also supported by a tangible prop called *Luck Stone(LS)* (Figure 7), which is similar to the dice in conventional RPG systems.

EG supports the gameplay of TTPRG in several aspects. The first advancement provided by EG is the automatization of the character creation process (C2). The character creation takes effect as the players attach their elemental stones to the EG (Figure 3). This also slightly differentiates each device depending on the character properties and creates customizability (C3). Players also can customize the body part of the EG according to their preferences by using the hexagonal parts (Figure 5). By customizability, we wanted to create the perception that each device belong to the unique characters of players in imaginary worlds and are actually costumes/equipment of fictional character's that can lead to increased immersion and better identification with the fictional character according to previous studies [6,12].

Furthermore, EG enhances the sensory part of the game with simple light and haptic feedback without using distracting elements such as displays (C3). These feedbacks, other than indicating the success of the mini games, can be used by GM to warn players about specific cases like spell-affected areas. This functionality lets GM covertly warn players when needed. Moreover, most of the mini-games are

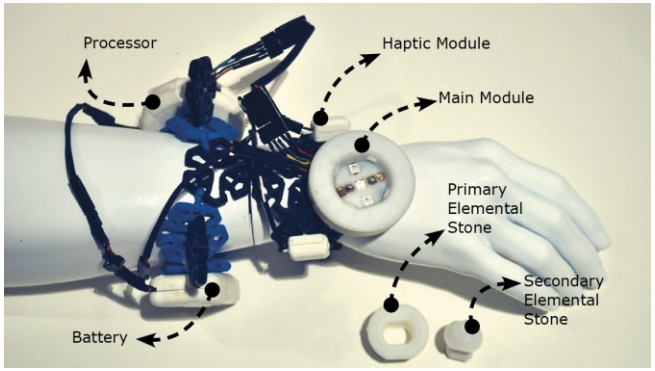

Figure 6: Parts of the Elemental Gauntlet

facilitated by EG and the results are calculated and transferred to GM panel by eliminating the need for uncaptivating dice calculation process [5].

While each player has an EG, LS is a mutual and a tangible (C1) object which can be used by all players. Previous research indicates that, auxiliary props are important for players and the interaction between electronic devices and these props should be considered by designers of augmented table-top games

Figure 7: Elemental Gauntlet (EG) and Luck Stone (LS)

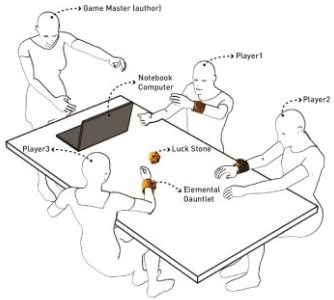

Figure 8: Demo Setting

[2]. Moreover, another research indicates that dice are an important part of table-top gaming experience [4] and materiality of board games is an essential element for players [10]. Therefore, LS is designed as a randomizer in the shape of a dodecahedron to provide similar experiences. When it is a player's turn, this player will interact with LS and roll it like dice after she/he completes the mini game. LS, aside from being used in some of the mini-games, has color changing surfaces. If the player is successful, number of green sides increases, boosting the chance of getting a better result from the dice-roll.

Demo Setting

Game will take place around the table which will be dedicated to this project in the demonstration area (Figure 8). During the demo session, we will allow players to attach elemental stones to their devices and play in speed-scenarios where they can try several moves to understand the essence of our game environment.

Conclusion

Our pilot studies with experience prototypes and the previous work in the field indicate that embodied interaction and wearable devices can enhance identification feeling and player motivation. To explore this topic deeper, we developed a novel game environment comprised of arm-worn devices, a tangible device and movement-based gameplay. We believe that this new concept will be favored by DIS audience which will grant us valuable insights to improve this work further.

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