Game user manuals

Contents

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

4.1 Introduction

The main aims with implementing these games are to explore the possible health benefits of exergames for people with intellectual disabilities and to test whether they can serve as a motivational tool for its users to increase their physical activity level.

Games

Two exergames have been developed to be used in the pilots:

- AGA (Activity Game avatar)
- Sorterius

Aims

- To motivate increased physical activity in people with intellectual disability
- To maintain the users' interest in the game over an extended period.
- To tailor an exercise application towards people with intellectual disability.
- To make it easy to integrate the app into everyday life.
- To create games that can be played alone and together with others.
- To make the games available in multiple languages.

4.2. AGA (Activity Game Avatar)

4.2.1 Introduction

AGA is an interactive exergame for people with intellectual disabilities, where the goal is to increase physical activity levels in players, by using motivational mechanics and illustrating exercises in a game-environment.

What is AGA?

Activity Game Avatar is a mobile application which helps to improve physical activity among people with intellectual disability. It consists of a series of pre-defined exercises that the player can choose from. When selecting an exercise, the avatar shows the player how to move to do the exercise correctly. The player should mimic the avatar. Each exercise session is between 30-120 seconds and has varying degrees of difficulty. Music is played during exercises to motivate the player to complete the session.

When and where can AGA be used?

Exercises can be done either indoors or outdoors. The game can be played alone or together with others. Only a mobile device (either a mobile phone or a tablet) is needed. It is also possible to cast/transfer the screen to a larger screen (TV, computer screen). This is a good option when multiple people want to play together. Versions for both Android and iOS (Apple) are available.

4.2.2 Core features

Character selection

Several customized avatars are available for the user to randomly select from. Figure 1 gives some of the available characters.

Animals

Different animals move in the background of most screens. This was added as a motivational feature to keep the player engaged longer. A randomized number of animals appear when the character is selected and when each exercise is selected. Figure 1 also shows some of the available animals.

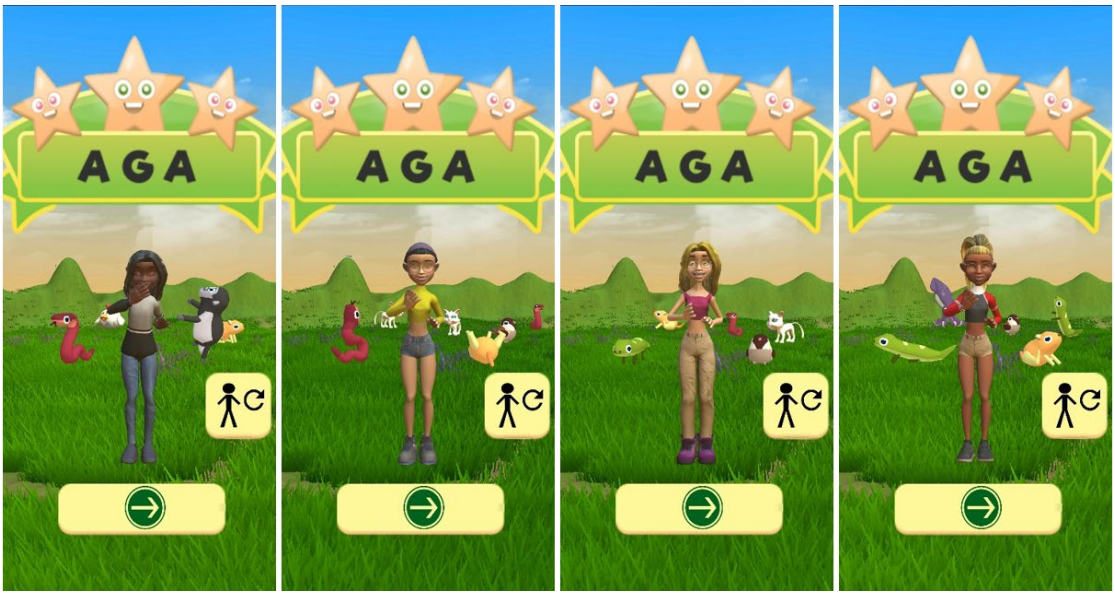

Figure 1 Screen shots: Illustration of characters and animated animals

Exercises

Currently six different exciting and motivating exercises are available for the player. Figure 2 displays the selection screen for exercises and shows some of the available options.

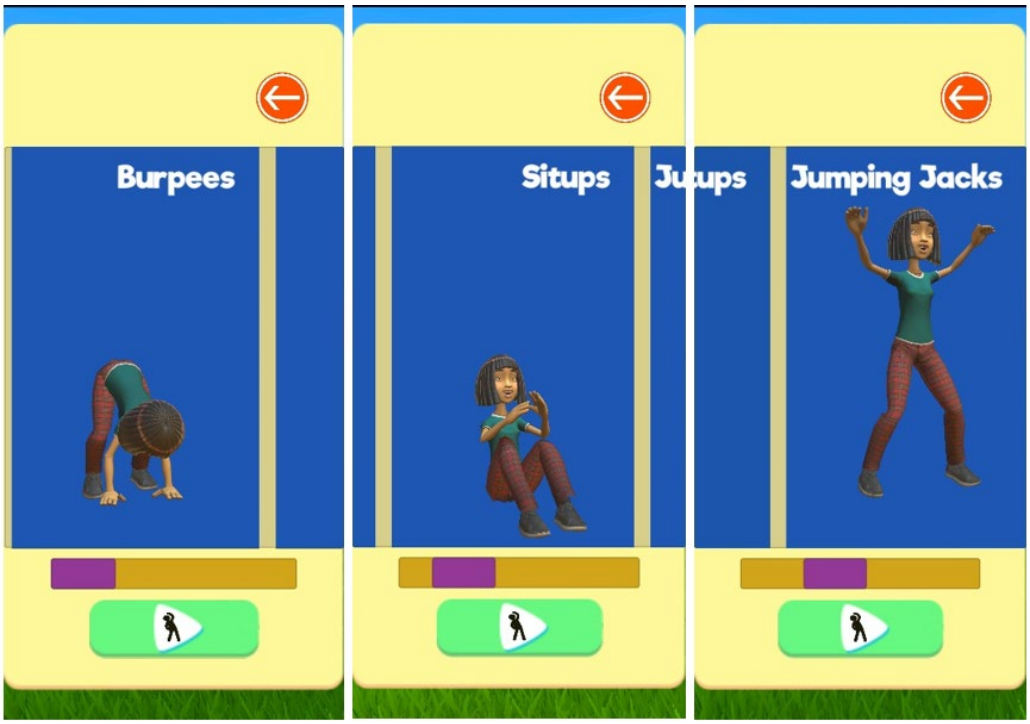

Figure 2 Screen shots: Activity type selection

Music

To keep the player entertained and motivated, energetic music plays when an exercise is active.

Rewards

Rewards are provided to keep the user motivated. The player collects stars when he or she finishes an exercise. A short animation will also show each star turning golden when received. Figure 3 illustrates awarding of stars.

Figure 3 Screen shots: Rewards given as stars, with animation.

Settings

In the settings menu the user can adjust the exercise speed and duration. The duration can span from 30 to 120 seconds. Figure 4 depicts the settings screen.

The settings screen is only available in English. Except for the exercise names (and the settings page itself), no other screens have any text. In order to make the game available for more people, intuitive images and icons are used instead.

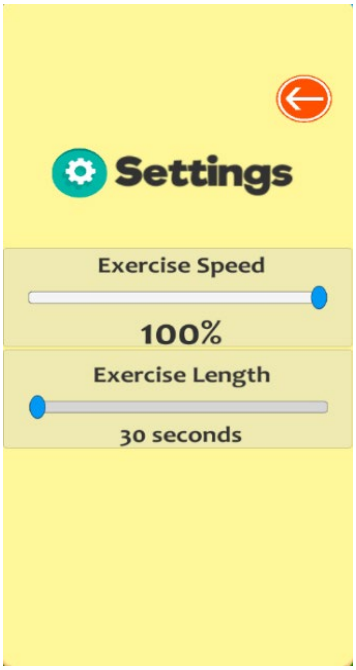

Figure 4 Screen shot: Settings screen

4.2.4 How to use AGA (User manual)

Step 1: Install the public AGA application from Google Play Store on your device. Just open the link below from your device, which should open the Play Store app, and then tap on the "Install" button next to the app name.

Link to AGA (Google Play Store): https://play.google.com/store/apps/details?id=no.uit.ifi.aga

(Note: There is no iOS version set up for the MOVE-IT pilots, as we expect all devices in the pilots to have Android. If this is not the case, contact both UiT and UPV)

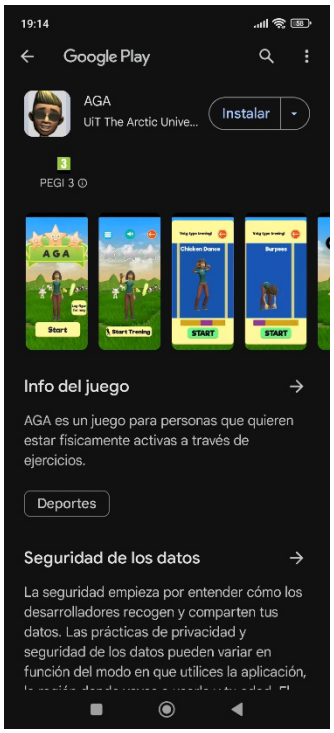

Figure 5 Process to install AGA app for MOVE-IT pilots.

Step 2: Select an avatar from the randomized options available, by clicking the avatar refresh button (Figure 6, yellow arrow).

Step 3: Click on green arrow button to START the exercise (Figure 6, red arrow).

Figure 5 Screen shot: Button for changing avatar (yellow arrow) and for starting the exercise (red arrow).

Step 4: Choose which exercise to do from the available set. Click the START button when ready to play (Figure 7, red arrow).

Figure 6 Screen shot: Exercise selection.

Step 5: If no music is preferred, the game can be muted before starting the exercise (Figure 8).

Figure 7 Screen shot: Shows mute button on/off

Step 6: There is a countdown of five seconds just before the exercise starts (Figure 9).

Figure 8 Screen shot: Countdown when starting an exercise.

Step 7: Play the game.

4.3 Sorterius

4.3.1 Introduction

Sorterius is an interactive exergame for people with intellectual disabilities, where the goal is to increase physical activity levels in players, by using motivational mechanics and using augmented reality to superimpose digital objects onto the real world, as seen through the mobile phone camera.

What is Sorterius?

Sorterius is a mobile exergame developed to motivate increased physical activity levels for people with mild to moderate levels of intellectual disability. It is an augmented reality game where the user sees the real world through the mobile phone camera. Digital trash objects are super-imposed onto the real world, and the user must pick up these objects (by clicking on the screen) and sorting them in different categories.

- The game play consists of aiding a mascot (Sorterius) in collecting and sorting located trash objects.
- The application is designed to accommodate varying levels of intellectual disability by providing three difficulty levels.
- The user interface is designed to be used by persons with intellectual disability, consisting of large buttons, easy-to-read text, and providing instructions automatically without user interference.
- The application utilizes a star-point system and digital rewards to motivate its users to play regularly.
- All text commands are translated to Norwegian, English, Spanish, Italian, and Portuguese.
- All text commands are also read out loud in the selected language.

Where and when can Sorterius be used?

The app works both indoors and outdoors. A mobile phone with a camera is needed. The user walks around and looks for appearing trash objects. Versions for both Android and iOS (Apple) are available.

4.3.2 Core features

Customization

The application provides the ability to change the mascot's appearance through a dedicated customization menu. Users can choose their preferred *color for the mascot* (Figure 10, left) and dress the mascot up in *various wearables* (Figure 10, right). The user interface for this menu is designed to be simplistic and easy to comprehend. A preview of the mascot is displayed to allow users to instantly view the appearance of the mascot as they iterate through the various unlocked items. New appearances are awarded by playing the game.

When a player is created for the first time, a customization menu shows up, prompting the user to “create your mascot”. In it, the mascot informs the user, both written and verbally (text-to-speech), of how to operate said customization menu. After a user has decided on their preferred mascot, they are sent to the main menu, where they can start playing.

Figure 9 Mascot colors and wearables

Reward system

The application will unlock up to two items for the mascot per day to reward users for their effort. When a user reaches one-third of their daily goal, a new item is unlocked. Similarly, after completing their daily goal, a new item is unlocked. Rewards are either a new avatar color or a new avatar wearable item.

Chest reward: To make the process of unlocking new items more interesting, items are enclosed by a 3*D chest* placed on the ground during game sessions (Figure 11), similar to trash objects. The chest has a jump animation, indicating that something inside is trying to break free. When the user taps on the chest, it is moved to the center of the screen (similarly to trash objects) and rotated to display the front of the chest.

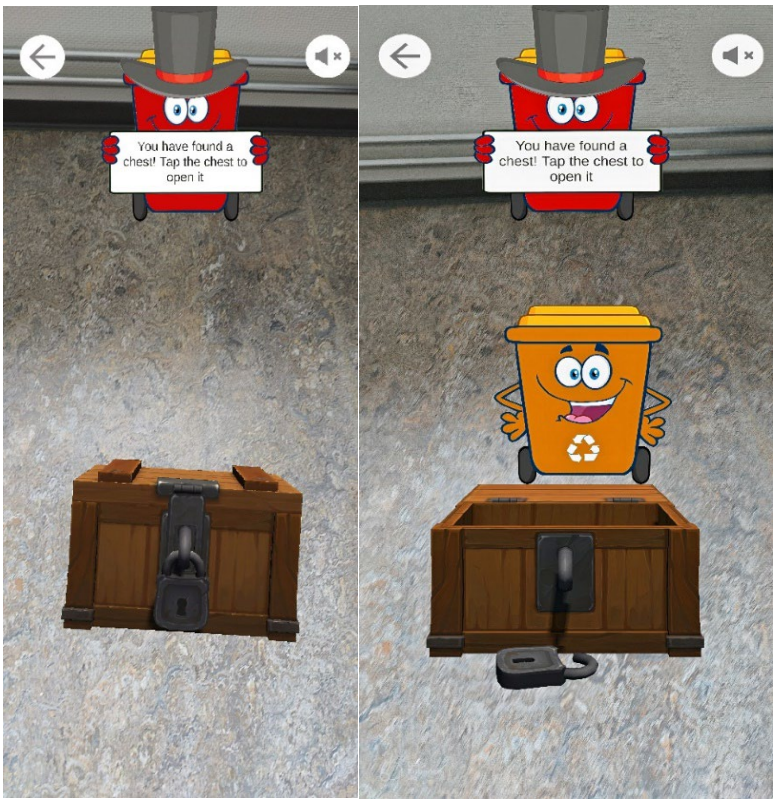

Figure 10 Screen shot: Example reward, before and after opening the chest

Subsequently, following a second tap, the top lid bursts open. The new item (wearable or mascot color) is then revealed to the user, rising from the chest while rotating horizontally.

A menu pops up to allow the user to apply the new item instantly (Figure 12). This menu features two images of the mascot (The current mascot and a preview using the new item). The user must tap the mascot they want, and then press the “Save” button (colored in green). They can press “Cancel” (colored in red) to keep the current mascot, regardless of the selection you might have made in this screen.

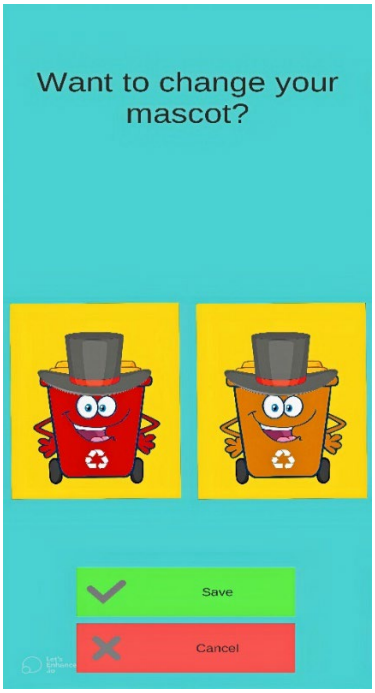

Figure 11 Screen shot: Popup allowing the user to change to the new item.

Stars reward: A maximum of three stars are given each day when the player reaches their goal (Figure 13).

Figure 12 Screens shot: Stars rewarded.

Hint During Game Session

Visual hints are given to the user after multiple failed attempts in sorting trash objects or when earning a new star.

If a user attempts to sort the trash object unsuccessfully two times for an object, the correct bin is animated with a shaking motion, to indicate that the user should try to sort the object in that bin.

Text-to-speech voice

The texts in the app are also available to the users through sounds. It helps to be more attentive with the game and allows the user to look away from the screen without missing new objects. When a new object is detected, the player will be alerted with the text-to-speech feature.

Vibrations

When the player walks past a trash object a vibration is added to alert the player. This helps the player to not miss that a trash object has appeared, and to walk without always looking on the device (especially if the game is played outdoors).

4.3.4 How to use Sorterius? (User manual) (MOVE-IT PILOTS ONLY)

Step 1: Join the beta for the Sorterius application made for MOVE-IT pilots from Google Play Store on your device. Start by opening the link below from your device.

Link to Sorterius (Google Play Store):
https://play.google.com/apps/testing/no.uit.ifi.SorteriusLuzi.Moveit

(Note: There is no iOS version set up for the MOVE-IT pilots, as we expect all devices in the pilots to have Android. If this is not the case, contact both UiT and UPV)

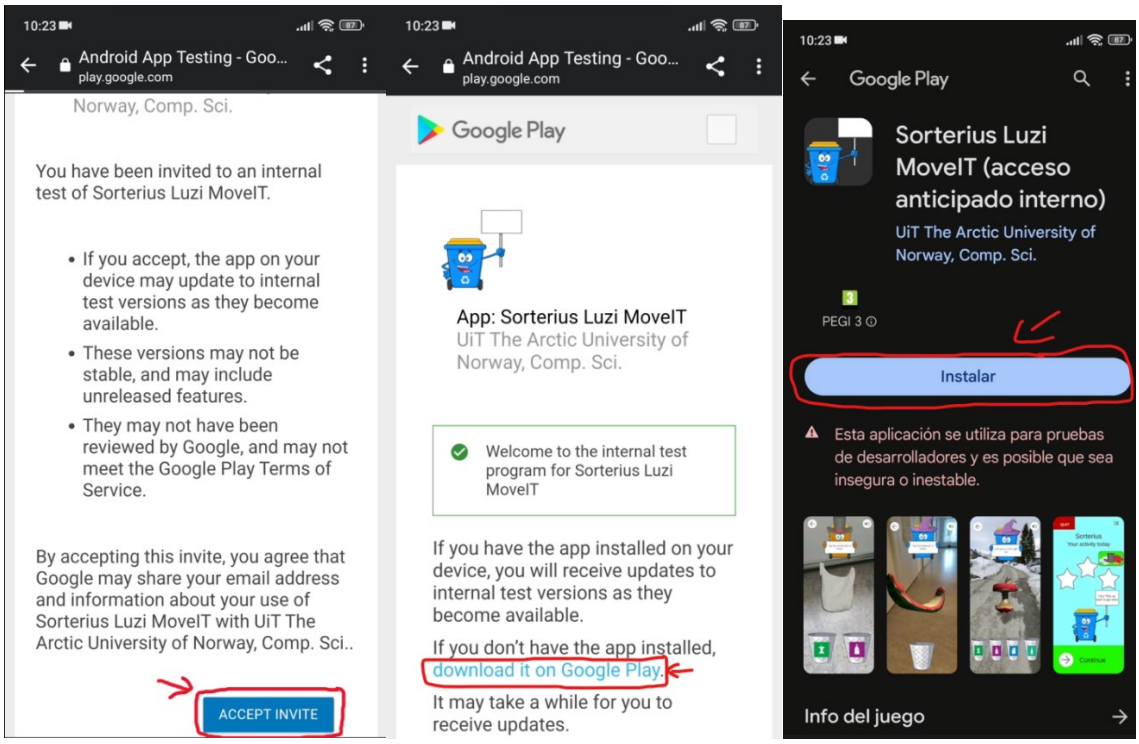

Figure 13 Process to install Sorterius app for MOVE-IT pilots.

As shown in the images above, the process for joining the beta and installing Sorterius once you click the link is as follows:

1. Go to the bottom of the page, and press “ACCEPT INVITE”
2. Click the link that says, “download it on Google Play”. Google Play will open, showing the Sorterius app.
3. Click the “Install” button from Google Play.

Step 2: Open the app. The first time it opens, it will prompt you to select your center for the MOVE-IT pilots. In this example, the centers are: Cercioeiras and IVASS. After that, the center you selected will be saved on the device so that you don't have to select it every time.

Note: If your center is not on the list, contact UPV so they manually add your center to the system.

Note 2: If you select the wrong center, you can reset the application by going to your phone's settings > Applications > Manage Applications > Sorterius Luzi MOVE-IT > Clear data > Clear all data. (The exact path might differ, depending on your phone's model)

Figure 14 Screen shot: Select pilot center (MOVE-IT Pilots).

Step 3: Once a center has been selected, the app will show you a player selection screen for your center (figure 16).

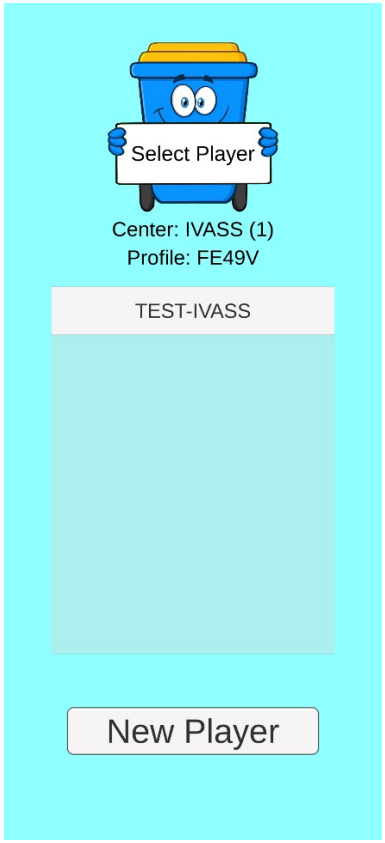

Figure 15 Player selection

If your player is not on the list, you can create a player by pressing the "New Player" button, typing a player name, and pressing "Create" (figure 17).

Figure 16 Create new player.

Step 4: Before playing the mascot can be customized. Two options are available for the customization (Figure 18): Mascot color and wearable.

Figure 17 Screen shot: Avatar customization.

Step 5: In the settings menu it is possible to change the language. In the same screen the daily step goal can be set. It is also possible to add other rewards (prizes). For instance, if a parent agrees to buy a movie ticket to the player after completing the activity goal, this can be added here. Some simple statistics can also be shown from this screen (Figure 19).

NOTE: For the MOVE-IT pilots, we HIGHLY RECOMMEND using this screen ONLY to CHANGE THE LANGUAGE. The rest of functionalities in this screen either don't work for the MOVE-IT pilots or have not been extensively tested.

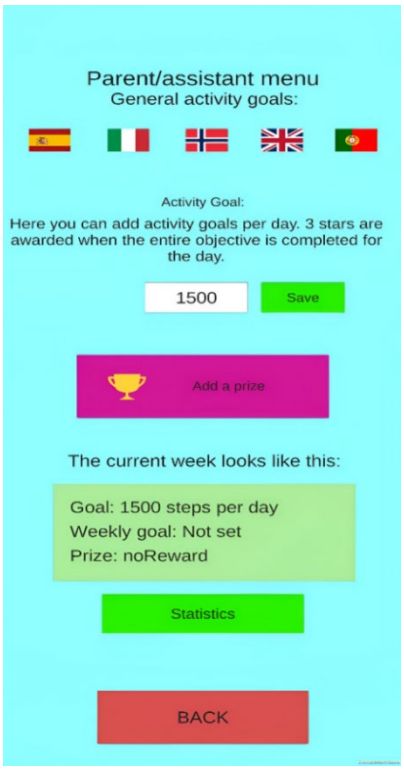

Figure 18 Screen shot: Settings.

Step 6: Once the mascot is customized and language is selected, click "Continue" (Figure 20).

Figure 19 Screen shot: Main menu - Starting game.

Step 7: The next screen displays the three available levels of the game: Easy, Medium, Hard. Select the difficulty level by pressing its respective button (Figure 21).

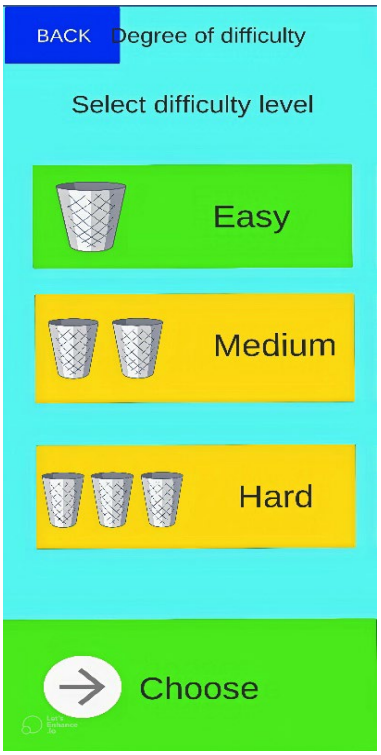

Figure 20 Screen shot: Difficulty selection.

Step 8: Now you can start the game by pressing the "Start game" button (Figure 22).

Figure 21 Screen shot: Start game

Step 9: The game has started. Now move around to find the trash and put it in the bin. When you find the trash 'tap' on it and then tap on the dust bin.

Step 10:

If *Easy* level is chosen, when a piece of trash is found, a single bin is displayed. The player can put the trash into it regardless of the type of trash (Figure 23).

If *Medium* level is chosen, the player can select the number of trash objects they want to look for: 10, 20 or 30. In medium difficulty, two categories of trash bins (food and plastic) will be shown (Figure 24).

If *Hard* level is chosen, there will be a selection for number of trash objects to look for as well (10, 20 or 30). There will be four categories of trash bins (food, plastic, paper, and glass) (Figure 25).

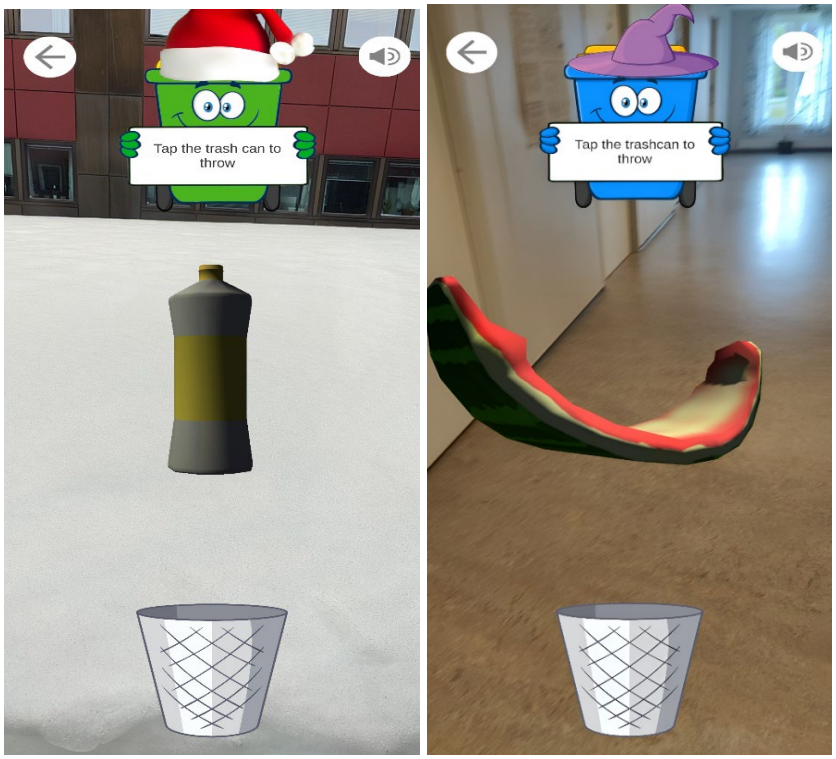

Figure 22 Screen shot: Trash detected. Easy level with one bin.

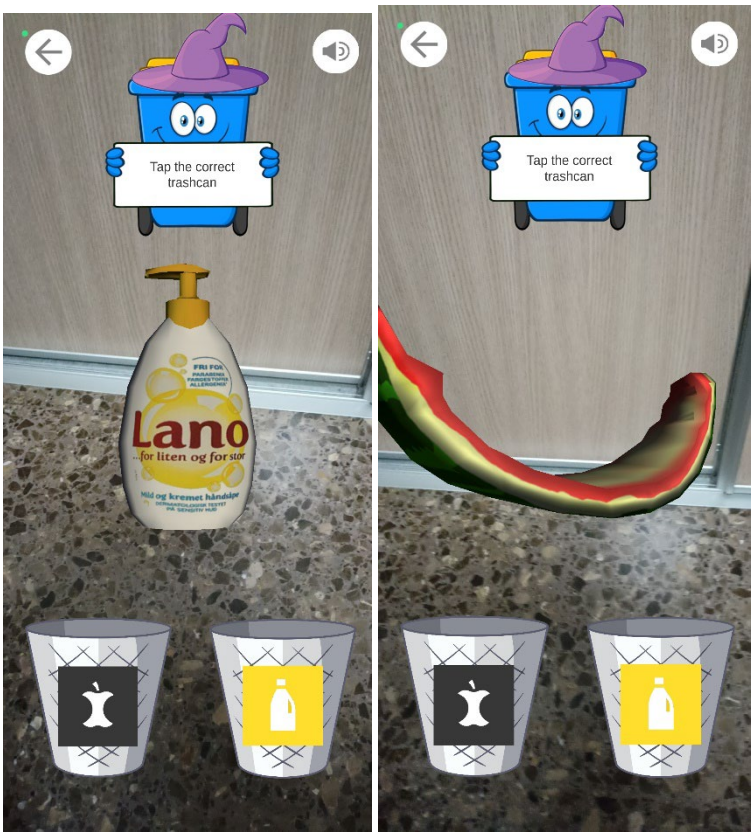

Figure 23 Screen shot: Trash detected. Medium level with two bins.

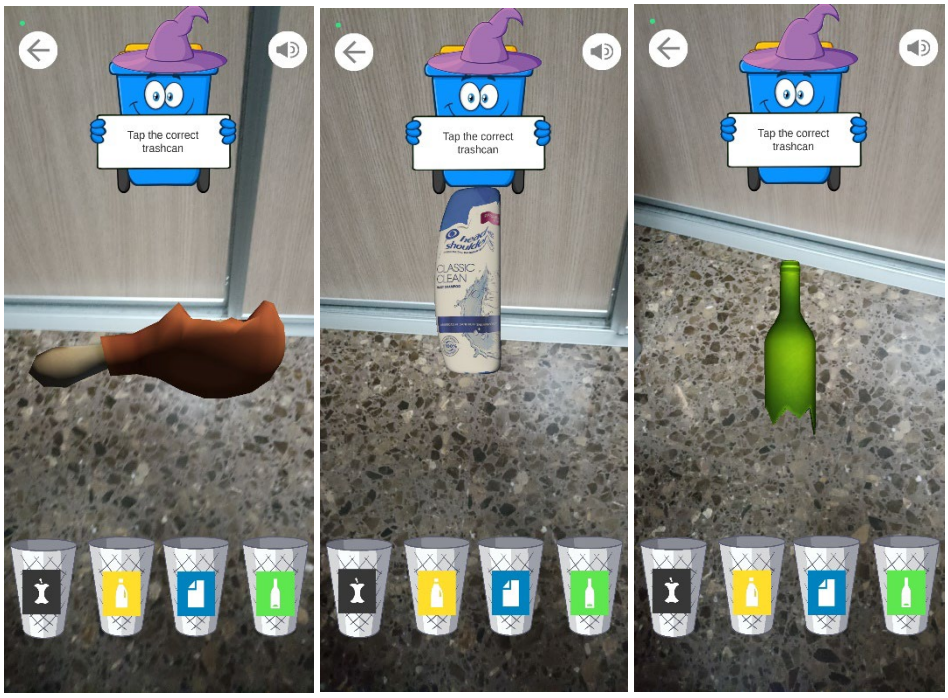

Figure 24 Screen shot: Trash detected. Hard level with four bins.

Step 11: When the trash is not put in the correct trash bin by the player, the correct bin will show some movement (as a hint). When the trash is put in the correct bin, stars will splash which helps to motivate the player.

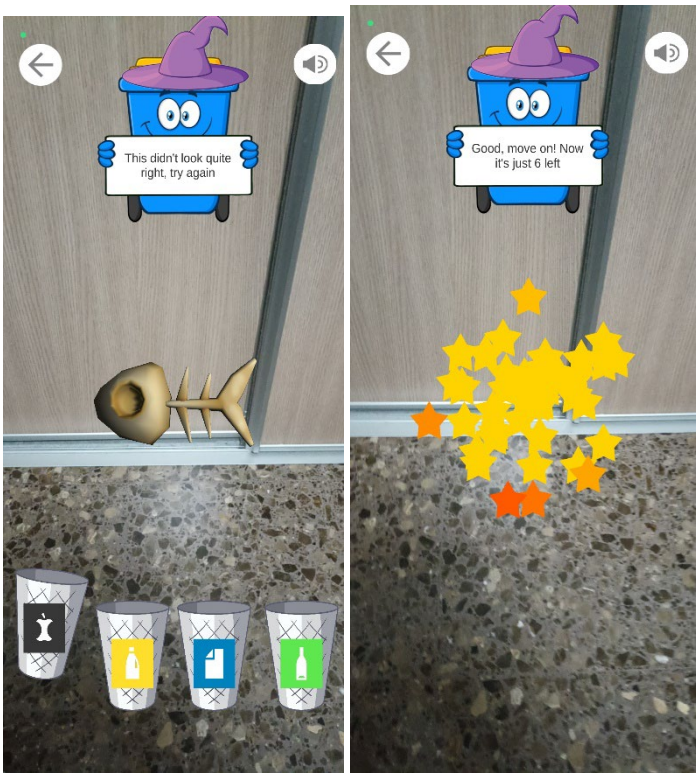

Figure 25 Screen shot: Trash bin movement.

Step 12: When the game is over, we can either play again or quit the game, going back to the main menu. (Figure 27).

Figure 26 Screen shot: Game over.

Step 13: The goal is to get three stars in a day (Figure 28).

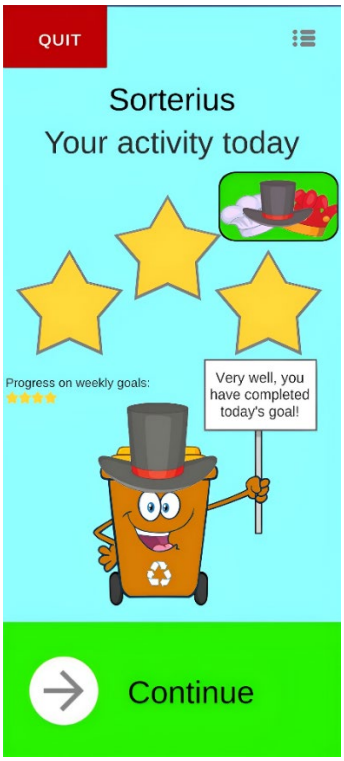

Figure 27 Screen shot: Three stars achieved today

4.4 Contributors

4.1 AGA

The following people has been involved in designing, implementing, testing, and documenting the AGA app:

Master's thesis (conceptualization and implementation)

- *Marius Wiik*, AGA: A Game-Inspired Mobile Application for Promoting Physical Activity in People With Intellectual Disabilities, 2019, https://munin.uit.no/handle/10037/15781
- *Thomas Eilertsen*, Activity Game Avatar: A interactive exergame for people with intellectual disabilities, 2021, https://munin.uit.no/handle/10037/20736

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4.2 Sorterius

The following people has been involved in designing, implementing, testing, and documenting the Sorterius app:

Master's thesis (conceptualization and implementation)

- *Magnus Stellander*, Sorterius: Game-inspired App for Encouraging Outdoor Physical Activity for People with Intellectual Disabilities, 2021, https://munin.uit.no/handle/10037/21446

- *Thomas Luzi*, Implementing Motivational Features for an Augmented Reality Game Encouraging Physical Activity for Persons with Intellectual Disabilities, 2022, https://munin.uit.no/handle/10037/25919
- *Dorthe Dybwad*, Culture Enhancement for Exergames for Individuals with Intellectual Disability, 2023, https://munin.uit.no/handle/10037/30396

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