Dancing Carpet

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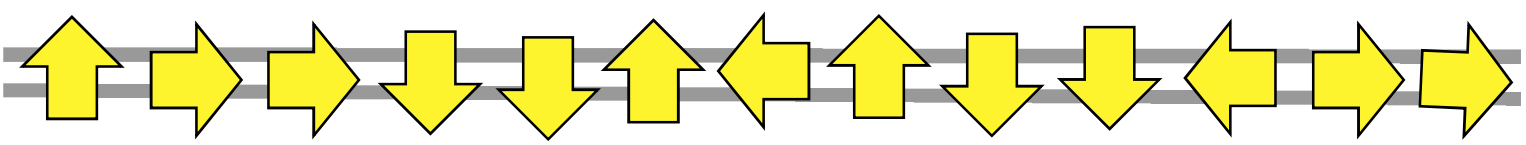

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Introduction

As part of our B. Sc. in Computers Science, we developed a VR game that based on the nostalgic Dancing Carpet game.

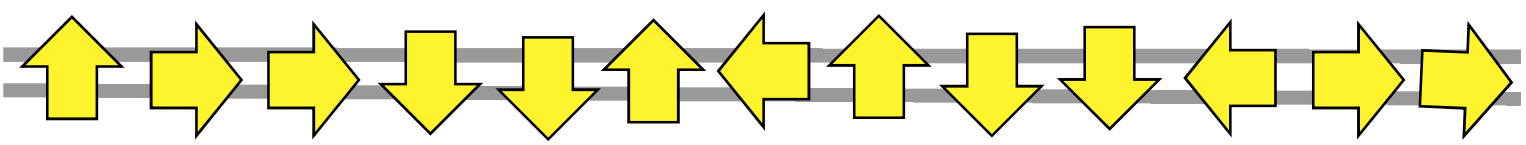
In the original game the player is standing on a board in front of a computer screen that provides him the right moves for the game, then the player needs to move in one of 4 optional directions (front, back, right or left) and move according to the given direction.

The directions and speed are defined according to the song the player chose.

Our application simulates the basic goals of the game but with a complete different user experience. In our game the virtual carpet is a part of the virtual floor and the user can see the lights turn on when he moves to different directions, unlike the original game, in ours we get an immediate response to the player's movement on the carpet itself.

Furthermore, there are different scenes such as dancing club or stadium so the player can get different experiences or chose his favorite.

The player’s main goal is to move his legs on the virtual carpet according to the directions he is getting in the board in front of him, for every correct movement the player gain point.



System

We created a game that runs on computer and played with VR gear, targeted specifically for the HTC Vive.

The application was developed using Unity 2018.2.6 (64-bit) game engine.

Equipment required

1. HTC-Vive Headset
2. 2 HTC-Vive trackers

The application uses the sight and sound options from the headset and the 2 trackers are attached to the player's ankles by matching straps.

Development process

Our first step in this long process was to create the carpet and to track the player's moments on it in different directions.

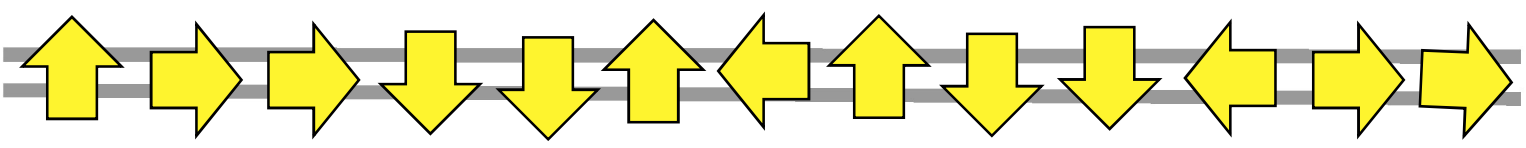
We have created a matrix that was the base to our carpet and with matching straps tied 2 trackers to each ankle. The first obstacle we faced was that when the player stood in the middle, even the smallest movement noticed as a step to a different part of the matrix, for example, even if the player stood with his legs a little bit open we might have seen it like he took a step to the right square in the matrix. One of the main decisions we took was to locate the player's movement only when he reaches the center of the square.

The next step was to build the arrows' board, we have used a tool for building special shapes and created an arrow shape, an important issue in this stage was to create a random sequence of arrows that run on the board in a changing speed that we can define as we wish.

After those steps we wanted to located the carpet and the board in the right places, at start, the carpet felt as it was too high and not part on the surface and we wondered what was the right location for the arrows boars, in order to decide we let couple of people try the basic version of the game we had so far. With those firsts reviews we locate the carpet and board according to the remarks of different players.

In our view, this stage in the development was the first basic version of the game, there were arrows running on the board in front on the player who stands on the carpet. In the next stage we needed to connect the steps the player took to the ones he was supposed to take according to the arrows directions.

In this stage we defined a reasonable range of time that a step in the right direction will be count, the range was determined from just a little before the arrow reaches the action bar in the higher part of the arrows' board and a little bit after he leaves it, we have noticed that without choosing this range and allowing the player some more time to take a step and not only at the exact moment the arrow reached its destination, it is too difficult to gain more that couple of points.

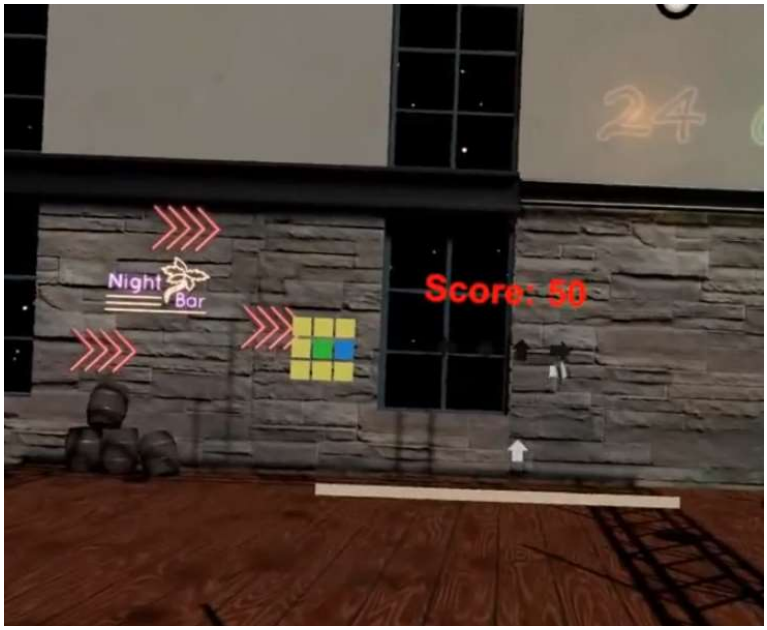


One of the most important stages in a VR project is creating the scenes, we wanted to give the player an authentic extraordinary environments for the game.

The first scene we have created is the most reasonable for this game – the dancing club, we used a lot of object from the asset store such as bar, tables, different drinks and musical instruments in order to create an environment as real as possible that will give the user the perfect experience.

Afterwards, we have decided that we wanted to expand the game to more scenes so every player can chose the environment he likes better or have a different experience every time he plays, therefore we have created the stadium and the outdoor scene.

In the last stage of development in the advice of our supervisor, we have added a duplicate of the carpet that stands in front of the player and showed him his moves, this feature is optional only in the easy level for new players.



Application overview

The application consists 2 main scenes for the user:

1. Main menu.
2. Game scene.

Main Menu

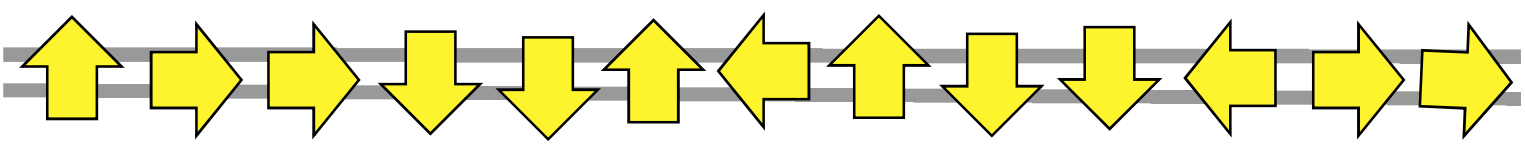
In this scene the player is standing in the middle of the matrix which is the dancing carpet, by moving his legs from the center to different directions the player choosing the game scene and the song.

The song that the player chose defines the rhythm and difficulty of the game, those are defining the number of movements the player should make in a minute. For example, choosing a rhythmic song will define a fast movement of the arrows that represent the steps that the player should make in order to gain points.

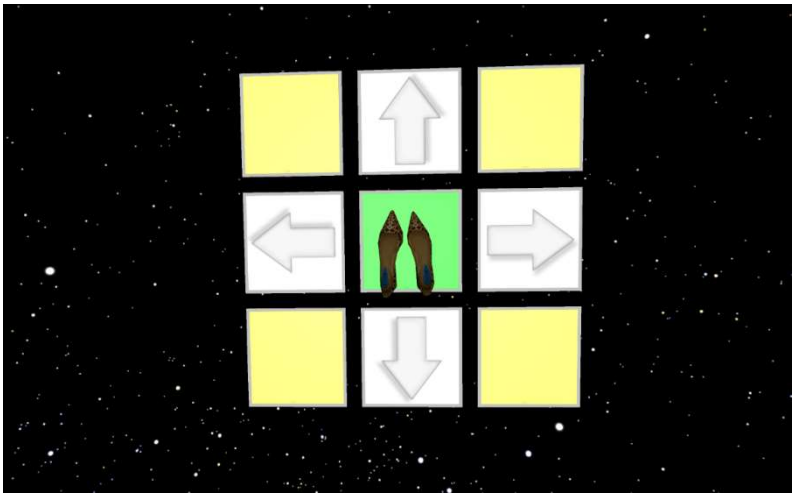
The second choice in this scene is the game's environment, there are 3 different scenes that the game can take place in.

After choosing those 2 option the game will start in the Game Scene.

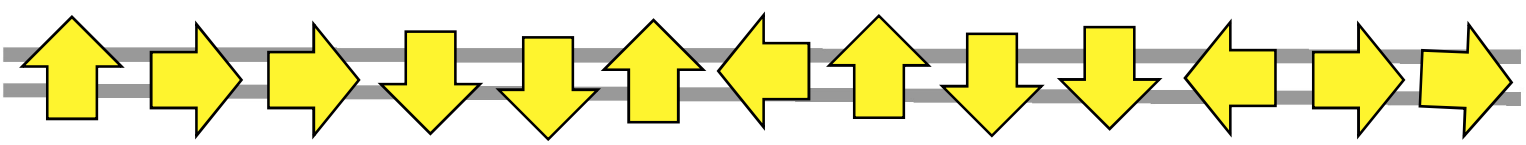
One of the main ideas we had was to develop the entire game while the player is using only the trackers on his feet – as can see in the picture, we have no need in other controllers.



In the upper picture we can see the player standing in the middle of the dancing carpet, every move to the arrows will shown by movment of the shoes.



The main menu:



Game Scene

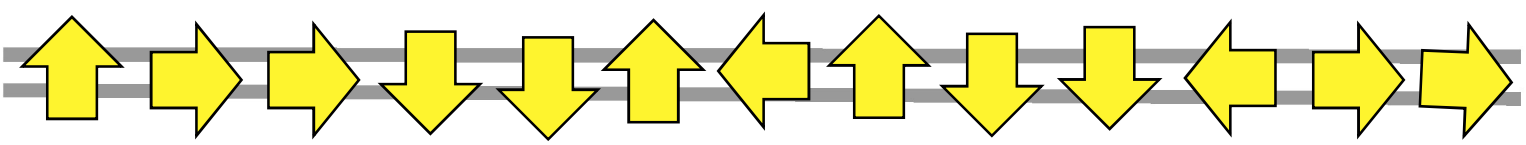
There are 3 different game scenes that are optional for the player, in all of them the player is centered in the middle of the dancing carpet and in front of him there is the arrows' board, when the game starts the player should move his legs according to the instructions on the board, for example, when an arrow pointed to the right appears, when it is getting to the action bar, which located in the top of the arrows' board, the player should take a stem to the right, the light on the board will turn on and in case the player took the step in the right time, he will gain points for this step.

להוסיף תמונה שמראה איפה צריך לבצע את הצעד (action bar) ובנוסף להראות שטיח שדריכה על צד ימין מדליקה אותו.

In the image before we can see an arrow reaching to the action bar and count as correct.

There are 3 different scenes for the game that can match every player and provide him the ultimate game experience.

In all of the scenes the players goal I the same – to gain as many points as he can.



Dancing Club

The dancing club scene is the most detailed and classic scene for this game.

In this scene the player is standing in a room in the middle of the dance floor while he is sounded by a bar, pool table, music instruments and many more objects that give him the feeling and the encouragement to dance as shown in the pictures below.

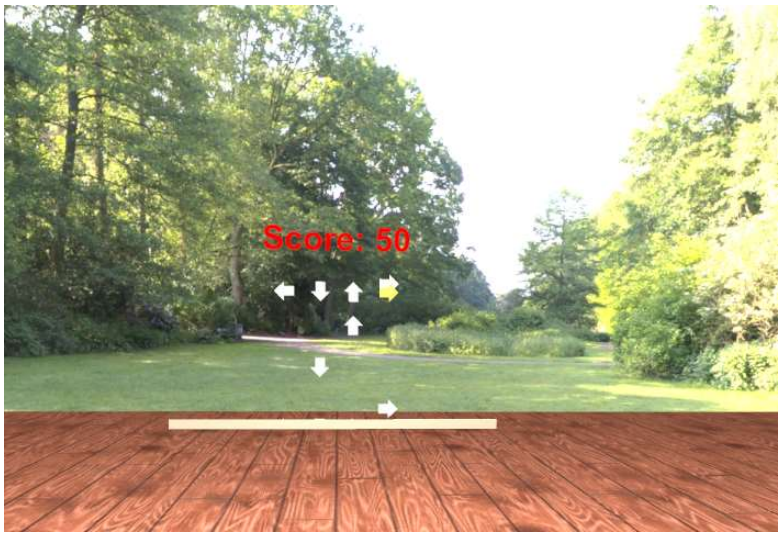

CLUB 9

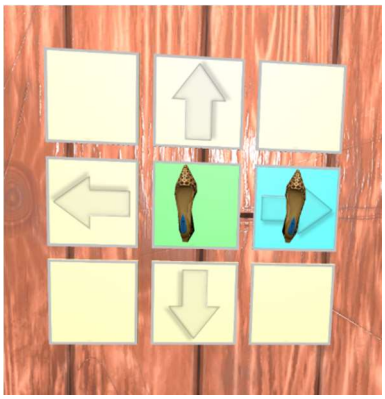

NIGHT
CLUB
Night
bar
Score:

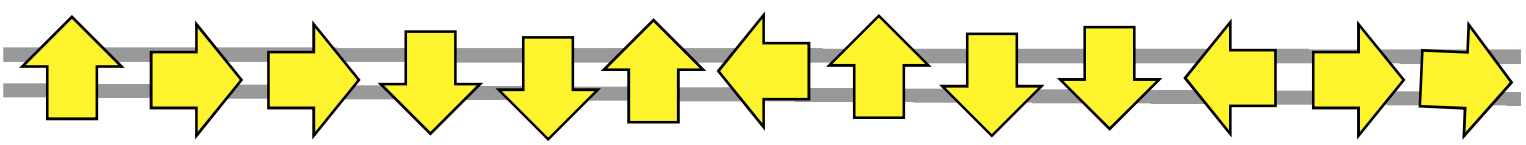
Outdoor

In the outdoor scene the player is standing on a raised platform in the nature.

In one of the pictures below we can see the dance carpet when the player takes a step to the right.







Stadium

In this scene the player is located in the center of the arena.

In the last picture we can see the feedback the player got for this game.