Appendix B: User Guide

B.1. Opening Menu

Button to access / open menu is located on the left hand. Button has spherical shape. If button's color is green (see Figure 1 - left), menu can be displayed. If color is red, menu cannot be shown because there's not enough space for it to be displayed (see Figure 1 - right) or it is already displayed (see Figure 2- right).

Figure 1: Menu can be opened (Left) and Menu cannot be opened (right)

To open menu for a short period of time insert one or more fingers of right hand to button sphere (touch your left hand with your right hand). After removing right fingers from button sphere, menu should be displayed next to left hand (see Figure 2).

Figure 2: Opening Menu

B.2. Meaning of Colors and Symbols

Color	Meaning	Can Destination be chosen?
Green	Destination is available	Yes
Gray	Current destination	No
Red	Unavailable destination	No
Yellow	Chosen destination	Already chosen

Table 1: Meanings of colors in menu

Icon	Target Location
	Tower of Hanoi (top left)
	Football field (top right)
	Hockey (bottom left)
	Vehicle (bottom right)

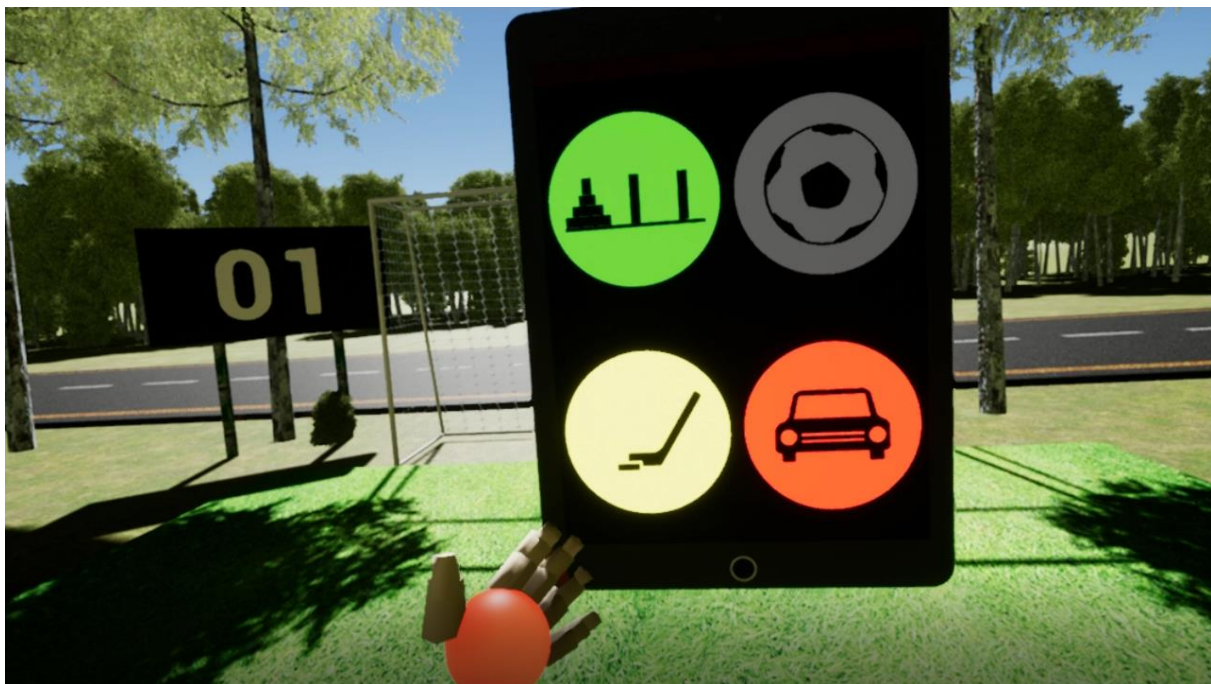Table 2: Meaning of icons in menu

Figure 3: Menu's colors

B.3.   Changing Location

While using this application in VR, user is able to change location / game directly from VR with no need of additional input device (other than LM or Kinect).
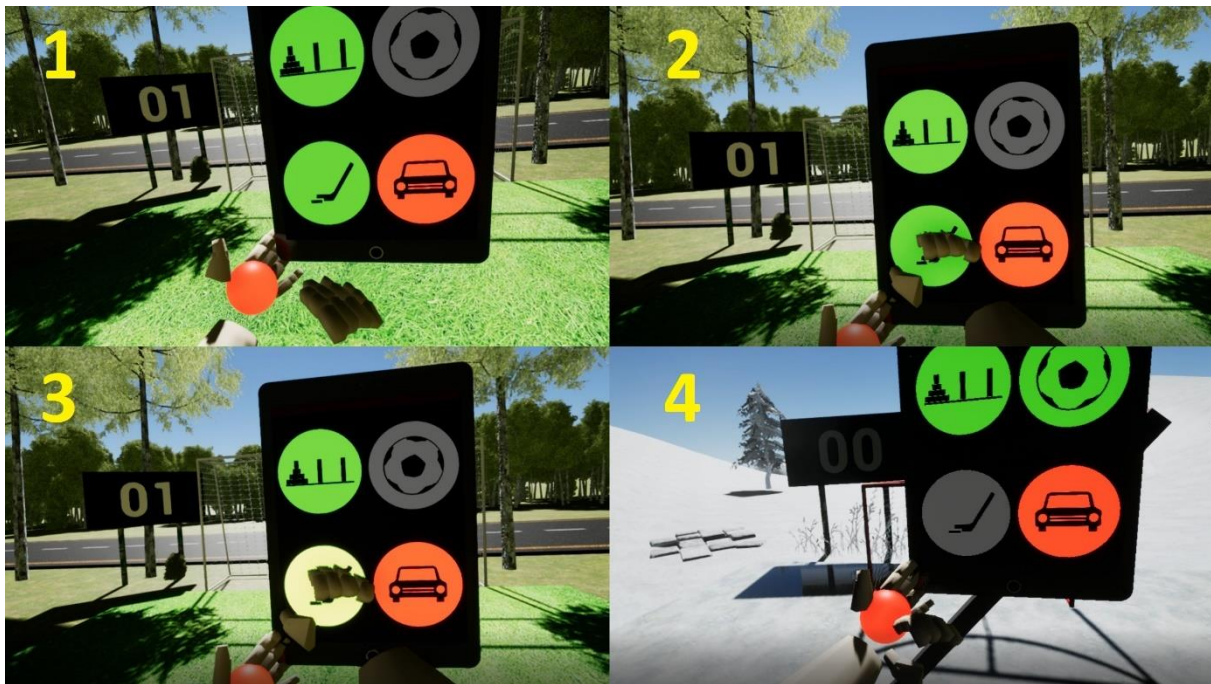
Figure 4: Choosing different location

After menu is opened (see Figure 4 - 1), user can press target location with right hand (see Figure 4 - 2). After registering press (see Figure 4 - 3), location icon changes color to yellow. If user chooses wrong destination, selection can be disabled by pressing icon of current or unavailable location within next two seconds. After two seconds delay passes, user is teleported to destination location (see Figure 4 - 4).

B.4. Closing Menu

Figure 5: Closing Menu

After arriving to target destination, menu will be opened. Procedure for closing menu (see Figure 5) is the same as for opening it (see Appendix B.1. Opening Menu).

B.5. Keyboard events

Implemented solution offers different keyboard actions to take place in VR. Complete list of supported action is in Table 3.

Keyboard actions are not meant to be performed by user in VR. Their purpose is to offer a help from outside of VR to user in VR if needed.

Key	Effect
Esc	Exit
B	Reset ball location in Football use-case (UC4)
P	Reset puck location in hockey use-case (UC5)
R	Rotate 180 degrees hockey puck in hockey use-case (UC5)
Q	Move Character upwards
W	Move Character forward
E	Move Character downwards
A	Move Character left
S	Move Character backward
D	Move Character right
Shift + Q	Change user representation (Joint Skeleton <-> Body Model)
Up	Drive vehicle forward
Down	Drive vehicle backward
Left	Drive vehicle left
Right	Drive vehicle right
T	Automatically organize TOH disks (Automatically centers disks around stick (recreates disk if missing))

Table 3: Implemented Keyboard shortcuts

B.6.   Rules

B.6.1.   Tower of Hanoi

Puzzle consists of 3sticks and multiple disks of different size. At the start of the game all disks are placed at the far-left stick. Disks are sorted by size from smallest at the top to larger at the bottom. Goal is to move all disks to one of empty sticks. It is possible to move one disk at a time and place smaller disk on top of larger or empty stick. Placing larger disk on top of smaller is not possible.