

First Person Shooter (FPS) games solution oriented to people with reduced mobility

Author: Gerardo Cilleruelo Beltrán
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Purpose

This project pretends to offer a new form of rehabilitative exercises by combining "First Person Shooter" (FPS) videogames with motion detection.

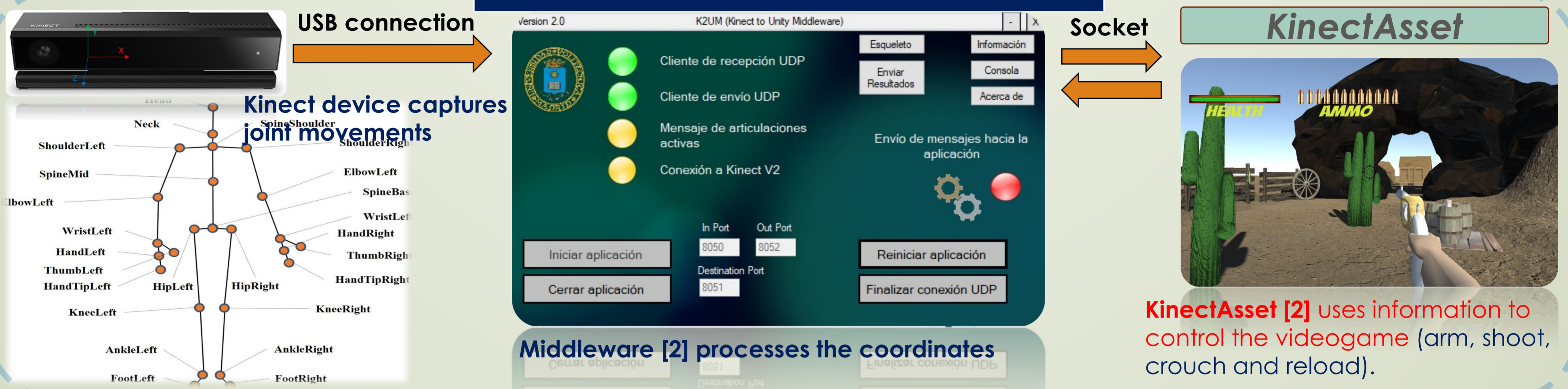
The technical solution is mainly focused on the possibility that people with reduced mobility can use the videogame in order to complement their conventional rehabilitation.

Apart from the technical solution, this final project has also developed several improvements on the formerly existing game environment "Blexer" (Blender Exergames).

Objectives

- Transform the videogame *WestGun* [1] into the therapeutic game *WestGun-Therapy*, controlled by gestures captured with a Kinect camera.
- Provide proper calibrations to simplify the gameplay for people with movement restrictions.
- Integrate the game with a web platform so that a therapist can adjust difficulty and monitor the performance.

ADAPTING THE VIDEOGAME TO KINECT TECHNOLOGY



MAKING THE GAME EASIER TO PLAY

ARM

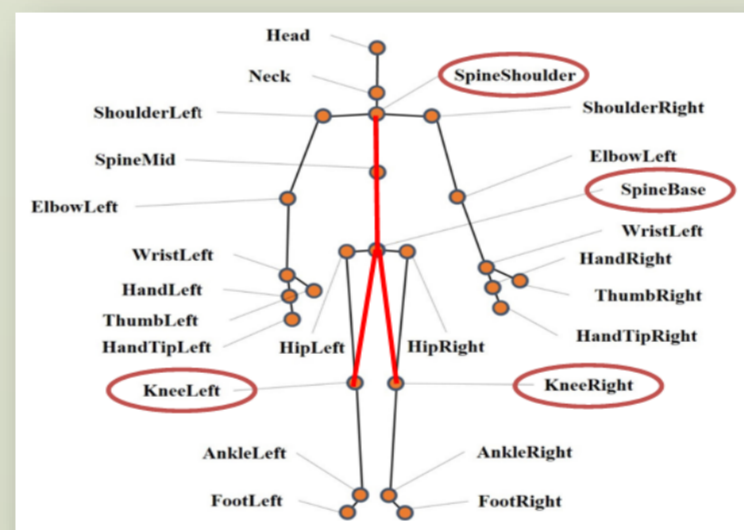
Adapt the player's range of movement to a full screen control of the 3d Arm

1. Use of **colour coordinates** in pixels (x, y)
2. Make **space transformation** and adjust it to the PC screen
3. **Set cursor position** and the 3D arm moves following the cursor



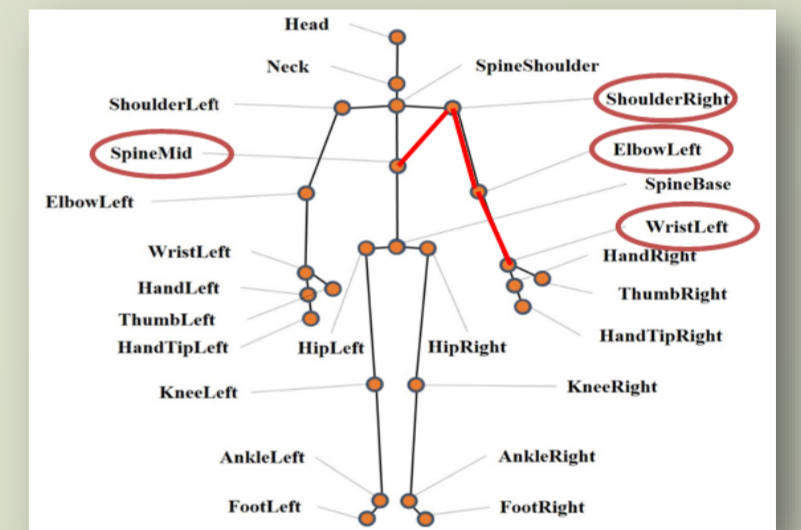
CROUCH

Choose how much you want to bend down



RELOAD

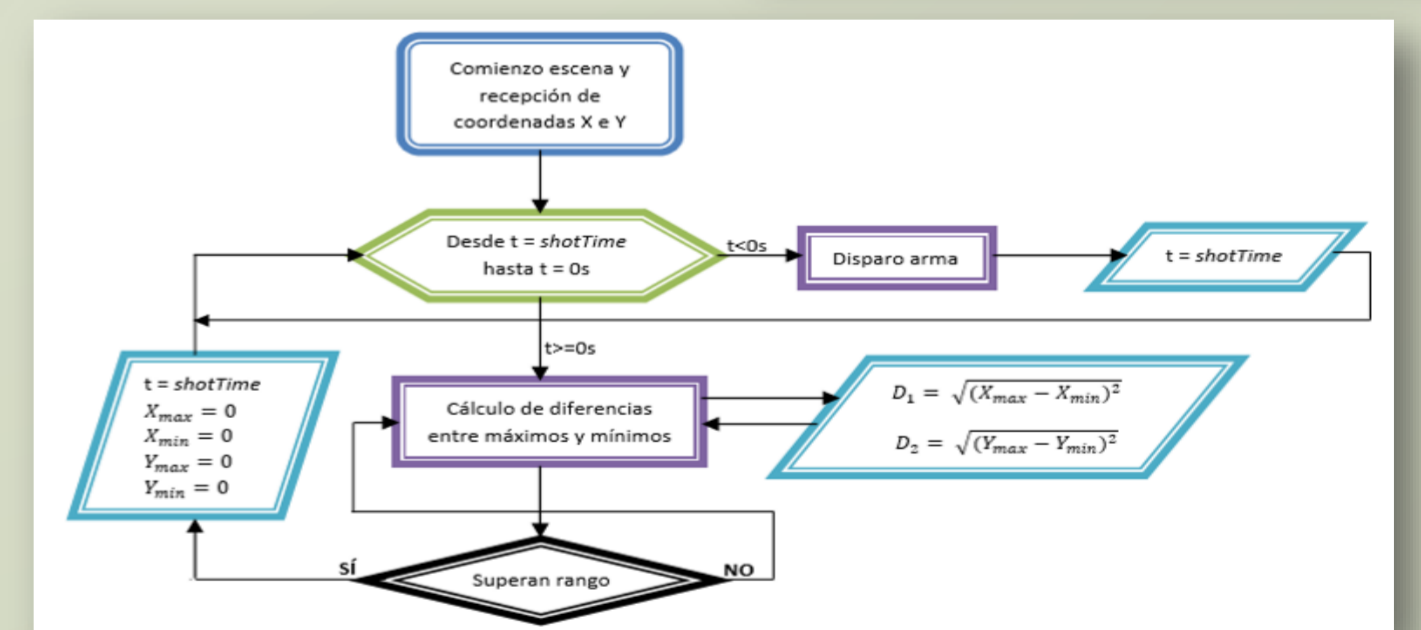
Choose the arm position to reload



SHOOT

Keep your hand still, point to the target and shoot

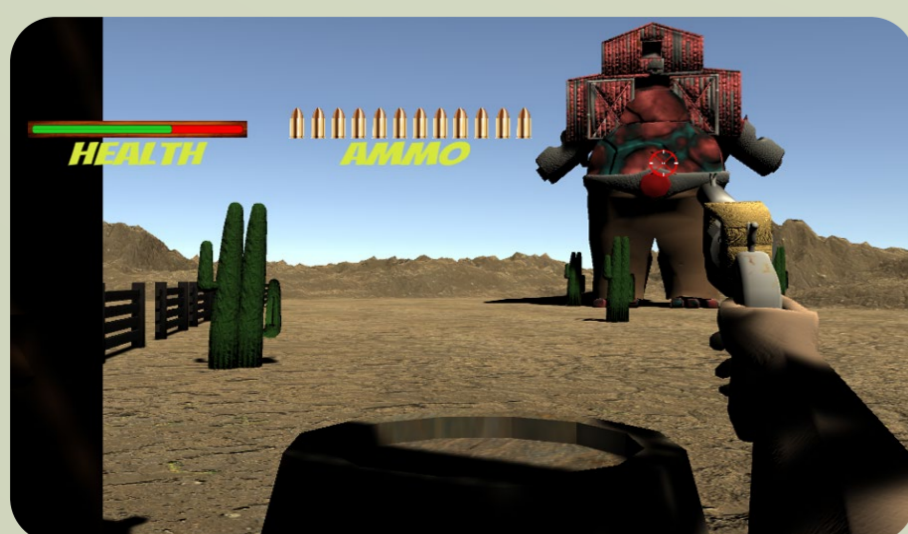
1. Use of **3D positions coordinates** (x, y)
2. The weapon will shoot automatically **every certain seconds**



GAME CONTROL SOLUTION

AIM OF THE GAME

Get through three different missions and kill all enemies before they do

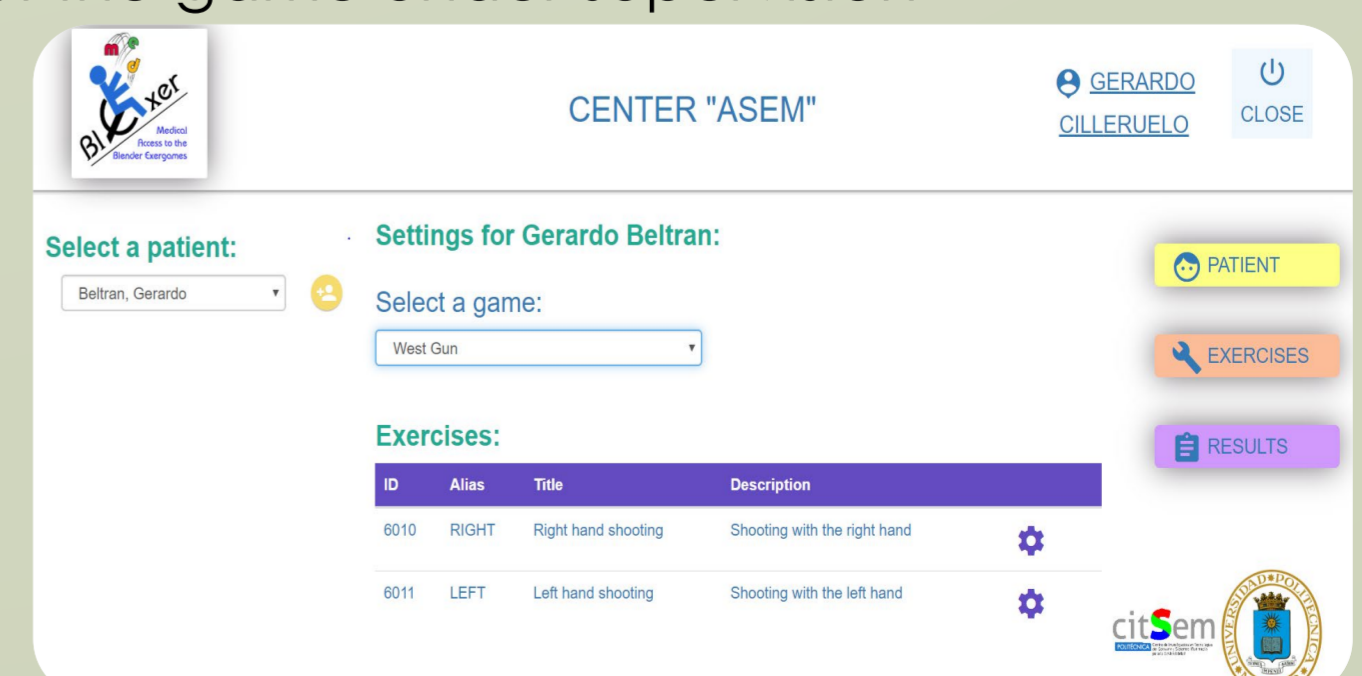


Nivel	Escena 1 (nº latas)	Escena 2 (nº enemigos)	Escena 3 (nº enemigos)
1	1	2	1
2	2	4	1
3	2	6	1
4	3	8	2
5	4	10	2

Levels of the game

INTEGRATING THE GAME TO THE WEB PLATFORM

- All results generated after playing are sent to the web platform by the middleware
- The therapist can establish configuration parameters to set the difficulty of the game under supervision



REFERENCES

- [1] G. Cilleruelo, A. Salom, N. Guillén. 2018. *GDD_V1 (WEST GUN)*. 2018.
[2] C. Luaces Vela, "Diseño e implementación de un entorno virtual de ejercicios físicos, basados en captura de movimiento", 2018

Results and future work

- ✓ The game is easy to play and engages the players
- ✓ The possibility to configure many different levels provides that players with different limitations can make good progress
- ✓ In the future it is necessary to improve the web integration and to test the game with disabled people