GAME DESIGN FOR ALL

AUTHORS

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1 INTRODUCTION

Physical disabilities strongly affect the quality of life of sufferers. Through physical therapy some motor functions can be restored.

When it comes to retraining motor skills, research shows that the important factors are the quantity, duration and intensity of training sessions.

To recover significantly, patients must therefore perform a substantial number of daily exercises.

The challenge is thus to create exercises able to decrease the monotony of hundreds of repeated motions.

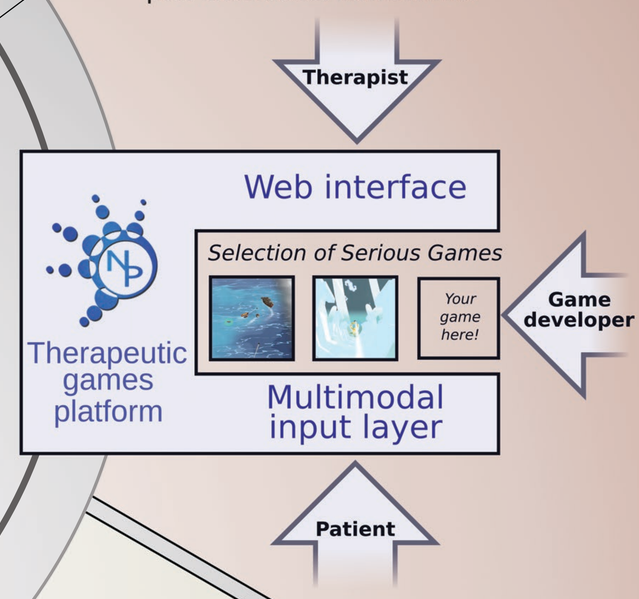
2 OBJECTIVES

Movement-based games, for instance those using the Wii Balance Board, are often commandeered for the purpose of therapeutic rehabilitation.

Gaming works well because a task-centered rehabilitation approach is more effective than simply asking a person to do different kinds of movements without specific goals. Games are also good motivational instruments.

Depending on the pathology however this can very impractical.

When this problem was discussed with an institute for occupational therapy. The idea arose to create an online platform dedicated to game-based rehabilitation and a set of games able to support multimodal interactions.



THE EXEMPLE OF HAMMER AND PLANKS

3 WORK OVERVIEW

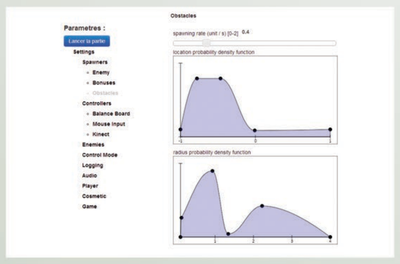
The first game implemented for this platform is “Hammer and Planks”. The player moves a pirate ship around the screen and attempts to avoid obstacles and enemies using body movements.
The goal was to aid hemiplegic patients with balance disorders to retrain their equilibrium.

The therapist can configure a number of game parameters on the fly, including the speed, number and positions of enemies and obstacles. This is all done through a dedicated web interface.

At the end of a game session, the interface allows the therapist to view game statistics such as the number of obstacles avoided or collided with, the time the boat spent in different areas of the screen as well as the trajectory of the patient's center of mass during the session.

As the game was designed for functional and postural rehabilitation it was natural to choose the Wiiboard as the preferred means of interaction.

Support for a set of additional interaction devices including tablets, joypads and the Kinect sensor was added later.



4 RESULTS : The MIG Exhibition

The vast array of input devices means that the game can be experienced in many different ways.

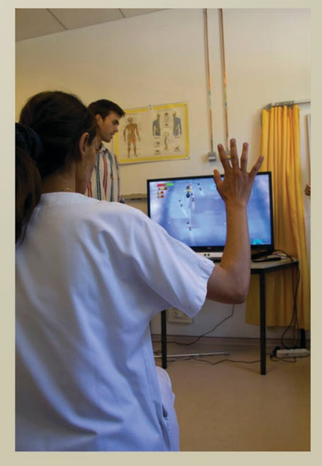
For each device players need to find strategies that they never needed to consider before. Hence the multitude of interaction devices provides not only flexibility for therapeutic purposes but also variety, to keep engaged the player.

During a 2 days exhibition we had more than 700 games of “Hammer & Planks” played.

Disabled Player
A number of patients undergoing physical therapy came to test the game. The positive experience they reported indicates that there is a real interest in this kind of flexible input scheme.

Mainstream Public
There were also a large number of players without any physical disabilities: this suggests that “games for all” really are possible.

Health Professionnals
Finally we had some interesting positive feedback from the health professionals who tested the game and the web platform. This raises hopes for a therapeutic validation of the system.



5 CONCLUSIONS

The psychological benefits of being able to play again after incapacitation due to disease or an accident are strongly underestimated: those without disabilities cannot appreciate the joy a disabled person feels when they are able to start playing again.

Being able to play with friends and family can also have a great impact on a disabled person’s life.

Thus even if 100% inclusion is not feasible, we believe that access to entertainment is.

We believe that serious games will be a big part of physical therapy in the future. We hope to continue developing “games for all” and studying their benefits in a therapeutic context.

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