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# VR for rehabilitation

- Research -



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Jaron Lanier already mentioned in 1992 [1], at a conference on VR and disabilities, the parallel between the development of interface for disabled people and the research in virtual reality; "Let's look at the human being closely. Let's see how people perceive the world or how they act. Let's design a computer to fit very closely around them, like a glove, you might say. Let's match up the technology to exactly what people are good at" (Lanier 1992). This pioneer view defines quite well the purpose of virtual reality and its links with technologies for rehabilitation and special needs, and highlights the impact these researches and experiments can have on the future of VR.

## Serious gaming : experimenting with interaction technologies

To show the possibilities of interface for serious gaming applications, we worked in the [SensoramaLab](http://SensoramaLab.com) on various 'demos' which investigate different tracking technologies and potential applications:

- The Space Race : Stereo camera tracking with infrared illuminator and reflective markers.
- The Toy Room: Accelerometer (3 axis, like in Wiimote).
- The Magic Carpet: Motion tracking with webcam.
- Penguin Racer: Camera motion detection, Soundbeam ultrasonic sensor, or a pair of accelerometers.

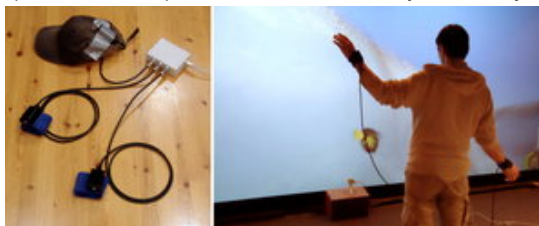
<p><b>Magic carpet</b></p>	<p><b>Pengin Racer</b></p>
<p><b>Space Race</b></p>	<p><b>The toyroom</b></p>

# Prototyping of rehabilitation applications

The field of rehabilitation has recently seen various experimentations with games using interfaces that require physical activity. In order to establish the basis for developments and experimentations with those interactive systems, we propose a rapid prototyping approach using various commercial devices and open source software.



**Webcam controlled PPracer** Planet Penguin Racer (or TuxRacer) can be controlled by full body movements thanks camera tracking



**Accelerometers to control PPracer** Same penguin game can be played with the hands holding accelerometers (wii-mote)

To demonstrate this idea, we first show how a simple free game can be adapted to specific needs for training or use by handicapped people by using different sensors and control modes.



Similarly, we show that an open on-line virtual worlds like Second Life, although not perfect, offers sufficient conditions for quickly building custom content and testing with usual interactive devices sold for handicapped. When presented to these prototyping possibilities, people from the target group (health care professionals, patients, handicapped, families) are able to relate to their needs and to elaborate on the use of such systems. In other words, the availability of a simple prototyping platform with free games and new interfaces already opens the discussion on the design of original rehabilitation applications.

>> Read the [PDF](#) from [ICVRAT 2008](#).

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[1] Lanier J. (1992). Keynote Address: Virtual Reality and Persons With Disabilities. In Center On Disabilities Virtual Reality Conference, Northridge, California, USA, 1992.