Name: Verónica Gemma García Martí

Educational background:

- **Currently Ph.D. student** in Physiotherapy (2nd year). University of València (Spain).
- **M.Sc. student**

  - Official Master in Functional Recovery in *Neurological physiotherapy.* Universitat de València.2017

  - Master in Neuroscience: medical, surgical and neurological patient rehabilitation. 2017
- **Phisiotherapy student.** University of Valencia.

Affiliation:

- Ph.D. student. University of Valencia
- Assistant Researcher. Regional Center for Multiple Sclerosis of Sardinia, Department of Medical Sciences and Public Health, University of Cagliari (Italy).

Virtual reality (VR) for motor rehabilitation in people with multiple sclerosis:

My Ph.D. trajectory includes a first year collaborating with Neurorehabilitation and Brain research group at Polytechnic University of Valencia, Spain, where I was involved in several research projects focused on the use of low-cost devices (in particular Microsoft Kinect v2 and Nintendo Balance Board) for the assessment of gait and balance in people with neurologic diseases.

During the second year of the Ph.D. I moved to Cagliari, where is present one of the largest specialized centres for MS which currently followed more than 4.000 people with MS (pwMS). As this center recently acquired a VR system specifically dedicated to neurorehabilitation (BTS Bioengineering NIRVANA) I was allowed to manage my own project focused in the evaluation of the effectiveness of such approach to improve motor functions in a cohort of pwMS:

There are not many studies focused in VR as a rehabilitation tool in MS. However, the studies we can find in literature have in common the use of some tool that restricts some kind of movement, as well as upper and lower limbs.

What NIRVANA offers is an immersive experience and total freedom of movement without using visors and wearable sensors, making patients with all kind of limitation take advantage of it. Moreover, it is the only system allowing the patients to directly interact with the virtual environment around them without the use of an avatar giving them more immersion. Besides, the wide range of games ad hoc for neurological patients allows the therapist to change parameters such as velocity, height, percentage of hits, rests, etc. to personalise each patient's rehabilitation, which is essential with these types of patients.

At the same time, during my 2nd year of Ph.D. I've also become familiar with the quantitative assessment of gait, balance and functional mobility in pwMS using state-of-the-art equipment such as motion capture systems, inertial sensors and force/pressure platforms. This allows me to use a wide range of clinical and instrumental tools to have a more detailed view of the functional impairments originated by the disease.

I want to give a (mark with X):

[X] Presentation (8-10 min. presentation + 5-10 min. feedback from expert panel)