

# Nintendo Wii Balance Board for Balance Disorders

José-Antonio Gil-Gómez, José-Antonio Lozano,  
Mariano Alcañiz

Inst. Bioingeniería y Tecnología Orientada al Ser Humano  
Universidad Politécnica de Valencia  
Valencia, España  
{jgil, jlozano, malcaniz}@labhuman.i3bh.es

Sergio Albiol Pérez

Computer Science and Systems Engineering Dept.  
University of Zaragoza  
Teruel, España  
salbiol@unizar.es

**Abstract**—This contribution presents the eBaViR System, a virtual rehabilitation system designed to be used in the patient's home. The system uses a conventional PC and the Wii Balance Board to carry out exercises specifically designed for the rehabilitation of postural instability and balance disorders.

**Keywords:** Virtual motor rehabilitation, Wii Balance Board, Balance disorders, Postural instability.

## I. INTRODUCTION

Nowadays, postural instability and balance disorders affect millions of people. Postural instability and balance disorders can be a consequence of stroke, ageing, positional dizziness and many other disorders. Although mortality from these disorders is very low, their influence in the decrement in a patient's quality of life is very high. The treatment for these disorders depends on the cause; but most types of balance disorders require balance rehabilitation and training, prescribed by a physiotherapist. This rehabilitation is usually an expensive and time-consuming process. Moreover, the success of this process depends on a patient's motivation and on the continuity of the procedure. Therefore, it is essential that the rehabilitation use a system that is attractive to the patient. Also, if the system allows the user to do the rehabilitation exercises at home, the continuity of the rehabilitation process is increased greatly. An ideal rehabilitation system oriented for use by the patient at home must be robust and simple, with an easy setup. Moreover, if the system is inexpensive it can be used widely.

The release of the Wii Fit (software) and the Wii Balance Board (platform) for the Nintendo Wii presented an important question in the field of rehabilitation: is the Wii Fit a real option for physical rehabilitation exercises?

Several authors have tested and given their opinion on the system [1, 2], and the general opinion is that the Wii Fit (with the Wii Balance Board) is a good tool for physical rehabilitation exercises, especially for stability training.

Following this direction we have developed a rehabilitation system –easy Balance Virtual Rehabilitation System (*eBaViR System*) - that utilizes the Wii Balance Board as the platform, but instead of using the Wii Fit it utilizes exercises that we have developed specifically for the rehabilitation of balance disorders.

For the conception, design and development of the exercises, a “user centered design” process has been adopted.

This process included continuous feedback from therapists. Considering the importance of the motivational factor in the rehabilitation process, all the exercises have been designed following a game layout.

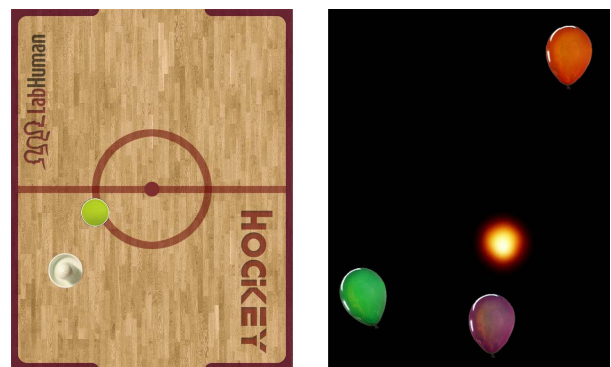


Figure 1. Some of the system games : left *Labhuman Hockey*, right *Balloon-Hunter*.

## II. DISCUSSION AND CONCLUSION

Currently we are finishing the evaluation of the ergonomic and usability aspects of the system. In addition, we are in the process of selecting the subjects for the clinical evaluation.

The eBaViR System has huge potential as an “at home” rehabilitation system because the required elements are affordable (a Personal Computer with no special features, and a Wii Balance Board –costing less than 90 €-), the setup is very easy (no initial calibration is needed) and the software is designed to be utilized by non-technical users.

For clinical specialists the system also offers high added-value for the rehabilitation process, not only because of the features previously described, but also because of the capabilities of the system: the games can be customized to adapt to the patient's limitations and the results attained by the patients in each session are recorded for later clinical evaluation.

## REFERENCES

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