NEW WEARABLE SYSTEM FOR THE STEP COUNTING IN DISABLE PEOPLE
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A moderate motion is an important aid for the prevention of serious pathologies such as the obesity, the diabetes, the cardiovascular pathologies and, more in general for prevention of the degeneration of the muscular & skeleton apparatus. The awareness of this led in the past to the interest in the design and construction of simple and wearable systems for the step counting which is an important index of motion activity. Pedometers have been widely used in literature. They have been used, for example, in studies focused in the prevention of the obesity [1], in applications for the prevention of cardiovascular problems [2], or in diabetes care [3]. Keenan and Wilhelm have enlightened that pedometers could be confounded by movement style, that may vary for different diagnoses and applications, as in the case of the Parkinson` s disease [4]. We have introduced a new wearable system for the step counting. The wearable system is based on a wearable device with a force sensing resistor and a band. It is affixed at the calf gastrocnemius level for the monitoring of the muscular expansion correlated to the gait. The system has been tested against a gold standard represented by a Biometrics System and one group of three subjects with Parkinson` s disease and at the second level of imbalance of the Tinetti test. for the classification of imbalance. Results obtained over an assessment of 200 steps performed by each subject with three different gait instructions (fast, normal and slow) showed a mean error lower that 0.5 %. The medical applications will cover the same applications of the pedometers. The system is expected to furnish useful and accurate medical knowledge in the motion monitoring of the obesity, in cardiological rehabilitation, in motion rehabilitation and in diabetes care. However is expected to furnish useful and accurate information in the motion monitoring of subjects with pathologies affecting balance such as the Parkinson` s and Alzheimer` s disease. The next step will be the design and construction of the device using the Surface Montage Technology.

REFERENCES

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