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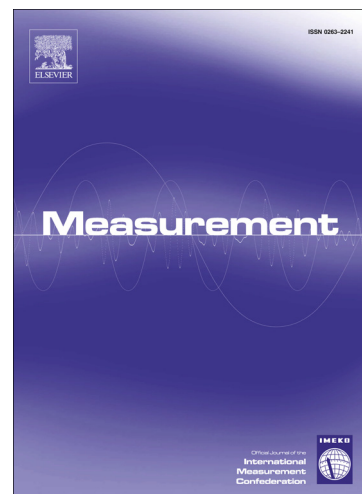
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Design and Validation of a Motion-Tracking System for ROM Measurements in Home Rehabilitation

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Abstract

This work deals with the design, implementation and experimental validation of a home rehabilitation system capable of bringing a real-time 3D reconstruction of human posture to the therapist's desk. The system has been validated against two commercial systems, capable of providing joint angle measurements and commonly used in rehabilitation gyms, which are used profitably to assist clinics in limb motor dysfunction treatment. Early experimental results promise to provide measurements accurate enough to complement the subjective therapist's perception with objective observations, leading to quantitative evaluation.

Keywords: Home rehabilitation, human motion tracking, joint angle, 3D virtual representation, orientation estimate, IMU.

1. Introduction

Over the years, physical rehabilitation has seen its relevance grow fast, drawing a lot of attention from engineering since improving the quality of life today means to impact more and more as population ages. The ultimate goal of rehabilitation process should be to fully recover people from temporary motor impairments, or, in case of permanent disorder, at least to mitigate

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