Assessment of movement and pose in a hospital bed by ambient and wearable sensor technology in healthy subjects

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The use of automated systems describing the human motion has become possible in various domains. Most of the proposed systems are designed to work with people moving around in a standing position. Because such system could be interesting in a medical environment, we propose in this work a pipeline that can effectively predict human motion from people lying on beds. The proposed pipeline is tested with a data set composed of 41 participants executing 7 predefined tasks in a bed. The motion of the participants is measured with video cameras, accelerometers and pressure mat. Various experiments are carried with the information retrieved from the data set. Two approaches combining the data from the different measure technologies are explored. The performance of the different carried experiments is measured, and the proposed pipeline is composed with components providing the best results. Later on, we show that the proposed pipeline only needs to use the video cameras, which make the proposed environment easier to implement in real life situations.

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