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Process modeling and assisted diagnosis in spinal recovery

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Abstract

The diagnosis and treatment of lumbar spine pathology represents a complex process involving many and diverse parameters that should to be investigated and processed. In order to properly approach the computer assisted treatment and diagnosis this paper presents a model of the process using BPMN and also a UML model for implementation. The data is supplied directly from the keyboard or from the Zebris equipment. The parameters investigated are: demographic data, disability status (4 degrees), daily activity expressed in calories (24 possibilities), Zebris mobility degree (minimum/ maximum - 6 values), and Zebris position rate (expressed as an angle). The inference engine of the presented method is created using fuzzy inference system. The data collected from the patients and the Zebris equipment is transformed in linguistic variables and the appropriate fuzzy inference rules are constructed. The consequences of the rules encode the actions that should be taken.

Relating the values of the investigated parameters screening values for each measurement can be established. Future work will result in prediction of recovery rate and also developing educational tools related to recovery domain.

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