

Data Collection Techniques for Robotics to Identify the Facial Expressions of Traumatic Brain Injured Patients

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Abstract : This paper presents the investigation of data collection procedures, associated with robots when placed with traumatic brain injured (TBI) patients for rehabilitation purposes through facial expression and mood analysis. Rehabilitation after TBI is very crucial due to nature of injury and variation in recovery time. It is advantageous to analyze these emotional signals in a contactless manner, due to the non-supportive behavior of patients, limited muscle movements and increase in negative emotional expressions. This work aims at the development of framework where robots can recognize TBI emotions through facial expressions to perform rehabilitation tasks by physical, cognitive or interactive activities. The result of these studies shows that with customized data collection strategies, proposed framework identify facial and emotional expressions more accurately that can be utilized in enhancing recovery treatment and social interaction in robotic context.

Keywords : computer vision, convolution neural network- long short term memory network (CNN-LSTM), facial expression and mood recognition, multimodal (RGB-thermal) analysis, rehabilitation, robots, traumatic brain injured patients

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