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Emotion detection from thermal facial imprint based on GLCM features (Article)

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Abstract

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Social intelligence in robots has been demonstrated and recognized in numerous contemporary studies especially for Human Robot Interaction (HRI). However, it has become increasingly apparent that social and interactive skills are prerequisites in any application areas and contexts where robots need to interact and collaborate with other robots or humans. The main focus now shifted on how the robots should perceive human affective states and manifest it through action. Recognition of human affective states could be achieved through affective computing by using numerous modalities such as speech, facial expression, body language, physiological signals etc. There are two approaches to access the affective states; invasive and noninvasive. Decades of researches and findings were mostly focussed on the invasive approach; Electroencephalogram (EEG), heart rate, blood flow, Galvanic Skin Response (GSR) etc. When it comes to affect recognition using noninvasive approach, very few numbers of publications have been done to date. In this paper, we presented an efficient method for thermal image feature extraction using the Gray Level Co-occurrence Matrix (GLCM) technique. By analysing the heat pattern on the facial skin, this work attempts to investigate the suitability of the thermal imaging technique for affect detection. The findings of this study indicate thermal imaging as a contactless and noninvasive method for appraising human emotional states. © 2006-2016 Asian Research Publishing Network (ARPN).

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Author keywords

Affect detection   Gray level co-occurrence matrix (GLCM)   Human robot interaction (HRI)   Thermal image

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