模糊邏輯應用於疲勞辨識系統

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摘 要

本論文主要是描述一個利用模糊邏輯判別駕駛人是否疲勞之安全警告系統(Drowsiness Warning System)。一般駕駛者在長途駕駛或精神不佳的狀態下，眼皮常會因為疲憊而漸感沈重，注意力也開始漸漸不能集中，產生雙眼難以睜開、反應力下降、注意力無法集中、連續打呵欠和汽車搖擺前行，儀表的判讀能力下降等情形。在這樣的情形下，便產生了潛在的肇事危機。本系統的發展架構主要是利用裝置在儀表板上的攝影鏡頭，擷取車室影像。利用影像處理中色彩空間改變、影像像素累加、影像平滑處理、影像灰階處理、影像二值化處理…等技巧由車室影像中抽取出駕駛人的臉部及眼睛位置，並計算眼睛開和閉的次數。因為疲勞為非定量且主觀的判斷，因此我們利用眼睛開閉兩參數當作輸入參數，駕駛人生理狀態當輸出參數，利用模糊邏輯(Fuzzy Logic)來計算駕駛人的疲勞程度，當疲勞時予以警示。

關鍵詞 : 疲勞警告 ; 車輛安全 ; 影像處理 ; 模糊邏輯

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