Distance Measurement Systems for Vehicular Collision Avoidance

許幼岳、劉仁俊 ; 陳木松

E-mail: 9121566@mail.dyu.edu.tw

ABSTRACT

智慧型車輛為現代車輛工業發展的主流，而車與車或前方物體的距離是行車時重要的安全指標。本論文主要研究影像測距和雷射測距，提升車輛防撞系統的功能。在雷射測距方面，我們使用現有的雷射測距設備，可以透過任何具有RS232介面的電腦或德州儀器的TMS320C6211 DSK來控制與讀取資料。模擬結果中將展示實車測試成效。在影像測距方面，我們使用單鏡頭散焦測距法。利用實際物體與光學鏡頭成像之間的幾何關係建立鏡頭的數學模型。由於影像的模糊會受到光圈與焦距的影響，所以可藉由影像的模糊程度計算出光圈或焦距與物體距離的關係。此外我們提出最小平方誤差法修正原本的單鏡頭散焦測距法，並得到良好的結果。

Keywords : 影像測距 ; 雷射測距 ; 車輛防撞 ; 單鏡頭散焦測距法 ; 最小平方誤差法

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