

側邊運動偵測之影像晶片設計

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摘要

本論文之主旨在設計一可偵測側邊物體運動及接近之影像晶片。所設計之側邊運動偵測電路能偵測動態影像之移動狀態。藉由此動態偵測電路可以判別出動態物體的運動狀態是越來越接近或是越來越遠離。動態偵測電路之功能及效能均由 Hspice 模擬驗證並整合至一 20×20 pixel 的影像晶片中。此影像晶片使用 TSMC $0.35 \mu m$ 2P4M 的 CMOS 製程，總晶片面積為 $2.48 \times 2.42 mm^2$ 。經過測試後發現，雖然本晶片中的電壓比較器其輸入端之偏移電壓過大，以致無法有效將各 pixel 感光結果相關聯，但所設計之晶片於兩個極端狀態中的測試結果與預期相符。

Design of a Vision Chip for Lateral Motion Detection

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ABSTRACT

This thesis presents the development of a vision chip for detecting lateral object motion and approaching. The movement detection circuit can detect whether a moving object is approaching or not. The circuit has been successfully simulated by Hspice and integrated into a 20×20 pixel array sensor chip. The vision chip is fabricated with TSMC 0.35 μm 2P4M CMOS process. The chip area is $2.48 \times 2.42 \text{ mm}^2$. After testing, we found that the offset voltage of inputs of comparator is too large, such that the correlation among photocells are not generated as expected. However, the function of photocells, registers and correlation in extreme cases are verified.