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SCHOOL OF MICROELECTRONIC ENGINEERING

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DESIGN AND ANALYSIS OF A VIDEO MOTION PREDICTOR

by

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ABSTRACT

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21st century has experienced a vast range of video application, from internet streaming to HDTV broadcasting. However, video data consumes a large amount of storage capacity and require high bandwidth to transfer wirelessly. Thus, these data need to be compressed. Motion estimation plays a vital role in compressing these video data efficiently to achieve low power and real-time application. This paper will discuss the design and analysis of motion estimation architectures implemented using UMHexagonS fast search algorithm. The results show that the architectures can perform motion prediction efficiently to achieve real-time performance.

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ABSTRAK

Abad ke-21 telah mengalami perbagai aplikasi video, dari internet streaming hingga penyiaran HDTV. Namun, data video mengambil sejumlah besar kapasiti simpanan dan memerlukan jalur lebar tinggi untuk memindahkan tanpa kabel. Dengan demikian, data ini perlu dikompreskan. Jangkaan pergerakan memainkan peranan penting dalam mampatan data video secara cekap untuk mencapai kuasa yang rendah dan aplikasi real-time. Thesis ini akan membincangkan tentang desain dan analisis anggaran gerak architecture diimplementasikan dengan menggunakan algoritma UMHexagonS carian cepat. Keputusan kajian menunjukkan bahawa architecture yang ditampir boleh melakukan ramalan gerak dengan cekap untuk mencapai prestasi yang real-time.

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Declaration of Authorship

I, LAI YOONG YEE, declare that the thesis entitled DESIGN AND ANALYSIS OF A VIDEO MOTION PREDICTOR and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

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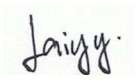
Signed:  .....

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Nomenclature

AVC	Advanced Video Coding
BMA	Block Matching Algorithm
FBMA	Full Search Block Matching Algorithm
HDL	Hardware Description Language
HDTV	High Definition Television
ITU	International Telecommunication Union
MPEG	Moving Picture Experts Group
QCIF	Quarter Common Intermediate Format
SAD	Sum of Absolute Difference
UMHexagonS	Unsymmetrical Cross-Shaped Multi-level Hexagonal Grid Search

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