

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy in Computer Science .

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Salihin Zakir Al-Tamimi
Supervisor

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Khairuddin Shahidan
Co-Supervisor

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree Doctor of Philosophy in Computer Science .

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Hamidah Koutoub Moustapha
Examiner