

I certify that I have read this dissertation and that in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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John L. Hennessy, Principal Advisor

I certify that I have read this dissertation and that in my opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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Oyekunle Olukotun

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Dwight Nishimura

Approved for the University Committee on Graduate Studies: