Massachusetts Institute of Technology
Department of Electrical Engineering
and Computer Science

Proposal for Thesis Research in Partial
Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy

Title: Building Dependability Arguments for Software Intensive Systems
Submitted by: Robert Seater
32 Vassar St. 32-G707
Cambridge, MA 02139

Date of Submission: March 10, 2008
Expected Date of Completion: December 2008
Laboratory: Computer Science and Artificial Intelligence Laboratory

(Signature of Author)

Brief Statement of the Problem:
A method will be developed for structuring dependability arguments about
partial, system-level properties of software intensive systems. The arguments
support a system-level property and trace that argument to code-level substantiation,
providing end-to-end traceability. The aim is to provide confidence,
not that a piece of software is correct in an absolute sense, but that it can be
depended upon to perform a particular task within the system. The method
will be evaluated on case studies drawn from the Burr Proton Therapy Center,
operating at Massachusetts General Hospital, and on the impact our analysis
has on the design and operation of that system.
Doctoral Thesis Supervision Agreement

To: Department Graduate Committee  
From: Doctor Daniel N. Jackson

The program outlined in the proposal:

TITLE: Building Dependability Arguments for Software Intensive Systems
AUTHOR: Robert Seater
DATE: March 10, 2008

is adequate for a Doctoral thesis. I believe that appropriate readers for this thesis would be:

READER 1: Doctor Edward Crawley
READER 2: Doctor Robert Miller

Facilities and support for the research outlined in the proposal are available. I am willing to supervise the thesis and evaluate the thesis report.

Signed:
Professor of Electrical Engineering
and Computer Science

Date: ____________________________

Comments:

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Doctoral Thesis Reader Agreement

To: Department Graduate Committee
From: Doctor Edward Crawley

The program outlined in the proposal:

**TITLE:** Building Dependability Arguments for Software Intensive Systems
**AUTHOR:** Robert Seater
**DATE:** March 10, 2008
**SUPERVISOR:** Doctor Daniel N. Jackson
**OTHER READER:** Doctor Robert Miller

is adequate for a Doctoral thesis. I am willing to aid in guiding the research and in evaluating the thesis report as a reader.

**SIGNED:**

[Signature]
Professor of Aeronautics and Astronautics
and of Engineering Systems

**DATE:** __________________________

Comments:

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Doctoral Thesis Reader Agreement

To: Department Graduate Committee
From: Doctor Robert Miller

The program outlined in the proposal:

**Title:** Building Dependability Arguments for Software Intensive Systems
**Author:** Robert Seater
**Date:** March 10, 2008
**Supervisor:** Doctor Daniel N. Jackson
**Other Reader:** Doctor Edward Crawley

is adequate for a Doctoral thesis. I am willing to aid in guiding the research and in evaluating the thesis report as a reader.

Signed:

Assistant Professor of Electrical Engineering and Computer Science

Date: __________________________

Comments:

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Doctoral Thesis Reader Agreement

To: Department Graduate Committee
From:

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Other Reader: Doctor Edward Crawley
Other Reader: Doctor Robert Miller

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Signed: __

Date: __

Comments:

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