

**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

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(SIGNATURE OF AUTHOR)

DATE OF SUBMISSION: March 10, 2008  
EXPECTED DATE OF COMPLETION: December 2008  
LABORATORY: Computer Science and Artificial Intelligence Laboratory

**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.

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**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:

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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: \_\_\_\_\_  
PROFESSOR OF AERONAUTICS AND ASTRONAUTICS  
AND OF ENGINEERING SYSTEMS

DATE: \_\_\_\_\_

Comments:

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TO: Department Graduate Committee  
FROM: Doctor Robert Miller

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DATE: March 10, 2008  
SUPERVISOR: Doctor Daniel N. Jackson  
OTHER READER: Doctor Edward Crawley

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and in evaluating the thesis report as a reader.

SIGNED: \_\_\_\_\_  
ASSISTANT PROFESSOR OF ELECTRICAL ENGINEERING  
AND COMPUTER SCIENCE

DATE: \_\_\_\_\_

Comments:

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SIGNED: \_\_\_\_\_

DATE: \_\_\_\_\_

Comments:

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