Submit only ONE copy of this form **for each PI/PD and co-PI/PD** identified on the proposal. The form(s) should be attached to the original proposal as specified in GPG Section II.B. Submission of this information is voluntary and is not a precondition of award. This information will not be disclosed to external peer reviewers. *DO NOT INCLUDE THIS FORM WITH ANY OF THE OTHER COPIES OF YOUR PROPOSAL AS THIS MAY COMPROMISE THE CONFIDENTIALITY OF THE INFORMATION.*

PI/PD Name: Kenneth R Fleischmann

Gender: ☒ Male   ☐ Female

Ethnicity: (Choose one response)   ☐ Hispanic or Latino   ☒ Not Hispanic or Latino

Race:
(Select one or more)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☒ White

Disability Status:
(Select one or more)
☐ Hearing Impairment
☐ Visual Impairment
☐ Mobility/Orthopedic Impairment
☐ Other
☒ None

Citizenship: (Choose one)   ☒ U.S. Citizen   ☐ Permanent Resident   ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):   ☒

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project   ☒

Ethnicity Definition:
Hispanic or Latino. A person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.
Race Definitions:
American Indian or Alaska Native. A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
Asian. A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
Black or African American. A person having origins in any of the black racial groups of Africa.
Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
White. A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

WHY THIS INFORMATION IS BEING REQUESTED:

The Federal Government has a continuing commitment to monitor the operation of its review and award processes to identify and address any inequities based on gender, race, ethnicity, or disability of its proposed PIs/PDs. To gather information needed for this important task, the proposer should submit a single copy of this form for each identified PI/PD with each proposal. Submission of the requested information is voluntary and will not affect the organization's eligibility for an award. However, information not submitted will seriously undermine the statistical validity, and therefore the usefulness, of information recieved from others. Any individual not wishing to submit some or all the information should check the box provided for this purpose. (The exceptions are the PI/PD name and the information about prior Federal support, the last question above.)

Collection of this information is authorized by the NSF Act of 1950, as amended, 42 U.S.C. 1861, et seq. Demographic data allows NSF to gauge whether our programs and other opportunities in science and technology are fairly reaching and benefiting everyone regardless of demographic category; to ensure that those in under-represented groups have the same knowledge of and access to programs and other research and educational oppurtunities; and to assess involvement of international investigators in work supported by NSF. The information may be disclosed to government contractors, experts, volunteers and researchers to complete assigned work; and to other government agencies in order to coordinate and assess programs. The information may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records", 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records", 63 Federal Register 268 (January 5, 1998).

0734894

02 INFORMATION ABOUT PRINCIPAL INVESTIGATORS/PROJECT DIRECTORS(PI/PD) and co-PRINCIPAL INVESTIGATORS/co-PROJECT DIRECTORS

Submit only ONE copy of this form **for each PI/PD and co-PI/PD** identified on the proposal. The form(s) should be attached to the original proposal as specified in GPG Section II.B. Submission of this information is voluntary and is not a precondition of award. This information will not be disclosed to external peer reviewers. *DO NOT INCLUDE THIS FORM WITH ANY OF THE OTHER COPIES OF YOUR PROPOSAL AS THIS MAY COMPROMISE THE CONFIDENTIALITY OF THE INFORMATION.*

PI/PD Name: William A Wallace

Gender: ☒ Male   ☐ Female

Ethnicity: (Choose one response)   ☐ Hispanic or Latino   ☐ Not Hispanic or Latino

Race:
(Select one or more)

☐ American Indian or Alaska Native

☐ Asian

☐ Black or African American

☐ Native Hawaiian or Other Pacific Islander

☐ White

Disability Status:
(Select one or more)

☐ Hearing Impairment

☐ Visual Impairment

☐ Mobility/Orthopedic Impairment

☐ Other

☒ None

Citizenship: (Choose one)   ☒ U.S. Citizen   ☐ Permanent Resident   ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):   ☒

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project   ☒

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Black or African American. A person having origins in any of the black racial groups of Africa.
Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
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0734879

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PI/PD Name: Russell W Robbins

Gender: ☒ Male   ☐ Female

Ethnicity: (Choose one response)   ☐ Hispanic or Latino   ☒ Not Hispanic or Latino

Race:
(Select one or more)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☒ White

Disability Status:
(Select one or more)
☐ Hearing Impairment
☐ Visual Impairment
☐ Mobility/Orthopedic Impairment
☐ Other
☒ None

Citizenship: (Choose one)   ☒ U.S. Citizen   ☐ Permanent Resident   ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):   ☒

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project   ☐

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Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
White. A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

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List of Suggested Reviewers or Reviewers Not To Include (optional)

SUGGESTED REVIEWERS:
Not Listed

REVIEWERS NOT TO INCLUDE:
Not Listed

List of Suggested Reviewers or Reviewers Not To Include (optional)

SUGGESTED REVIEWERS:
Not Listed

REVIEWERS NOT TO INCLUDE:
Not Listed

List of Suggested Reviewers or Reviewers Not To Include (optional)

SUGGESTED REVIEWERS:
Not Listed

REVIEWERS NOT TO INCLUDE:
Not Listed

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 04-23	FOR NSF USE ONLY
NSF 07-541 **04/10/07**	**NSF PROPOSAL NUMBER**
FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.)	**0734894**
SES - Ethics and Values in Science, Engineering and Technology	

DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION
04/10/2007	**2**	**04050000 SES**	**7915**	**790934285**	**05/29/2007 3:10pm S**

EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)	SHOW PREVIOUS AWARD NO. IF THIS IS ☐ A RENEWAL ☐ AN ACCOMPLISHMENT-BASED RENEWAL	IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ☐ NO ☒ IF YES, LIST ACRONYM(S)
526002033		

NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE	ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE
University of Maryland College Park	**University of Maryland College Park** **3112 LEE BLDG** **COLLEGE PARK, MD. 207422510**
AWARDEE ORGANIZATION CODE (IF KNOWN) **0021030000**	

NAME OF PERFORMING ORGANIZATION, IF DIFFERENT FROM ABOVE	ADDRESS OF PERFORMING ORGANIZATION, IF DIFFERENT, INCLUDING 9 DIGIT ZIP CODE
PERFORMING ORGANIZATION CODE (IF KNOWN)	

IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions)	☐ SMALL BUSINESS ☐ MINORITY BUSINESS ☐ FOR-PROFIT ORGANIZATION ☐ WOMAN-OWNED BUSINESS	☐ IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE

TITLE OF PROPOSED PROJECT **Collaborative Research: Educational Simulation for Computing and Information Ethics**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
$ **150,000**	**36** months	**01/01/08**	

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW

☐ BEGINNING INVESTIGATOR (GPG I.A)
☐ DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C)
☐ PROPRIETARY & PRIVILEGED INFORMATION (GPG I.B, II.C.1.d)
☐ HISTORIC PLACES (GPG II.C.2.j)
☐ SMALL GRANT FOR EXPLOR. RESEARCH (SGER) (GPG II.D.1)
☐ VERTEBRATE ANIMALS (GPG II.D.5) IACUC App. Date _____

☒ HUMAN SUBJECTS (GPG II.D.6)
Exemption Subsection _____ or IRB App. Date **04/02/07**
☐ INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES INVOLVED
(GPG II.C.2.j)
_____
☐ HIGH RESOLUTION GRAPHICS/OTHER GRAPHICS WHERE EXACT COLOR REPRESENTATION IS REQUIRED FOR PROPER INTERPRETATION (GPG I.G.1)

PI/PD DEPARTMENT **College of Information Studies**	PI/PD POSTAL ADDRESS **Room 4105 Hornbake Library Building** **South Wing** **College Park, MD 207424345** **United States**
PI/PD FAX NUMBER **301-314-9145**	

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Electronic Mail Address
PI/PD NAME **Kenneth R Fleischmann**	**PhD**	**2004**	**240-297-9159**	**kfleisch@umd.edu**
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				

Electronic Signature

0734894

CERTIFICATION PAGE

Certification for Authorized Organizational Representative or Individual Applicant:

By signing and submitting this proposal, the individual applicant or the authorized official of the applicant institution is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding debarment and suspension, drug-free workplace, and lobbying activities (see below), as set forth in Grant Proposal Guide (GPG), NSF 04-23. Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U. S. Code, Title 18, Section 1001).

In addition, if the applicant institution employs more than fifty persons, the authorized official of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of Grant Policy Manual Section 510; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflicts which cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

Drug Free Work Place Certification

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Drug Free Work Place Certification contained in Appendix C of the Grant Proposal Guide.

Debarment and Suspension Certification   (If answer "yes", please provide explanation.)

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded
from covered transactions by any Federal department or agency?   Yes ☐   No ☒

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Debarment and Suspension Certification contained in Appendix D of the Grant Proposal Guide.

Certification Regarding Lobbying

This certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding $100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	SIGNATURE	DATE
NAME **Monique Anderson**	**Electronic Signature**	**Apr 10 2007 3:35PM**
TELEPHONE NUMBER **301-405-6272**	ELECTRONIC MAIL ADDRESS **manderson@umresearch.umd.edu**	FAX NUMBER **310-314-9569**

*SUBMISSION OF SOCIAL SECURITY NUMBERS IS VOLUNTARY AND WILL NOT AFFECT THE ORGANIZATION'S ELIGIBILITY FOR AN AWARD. HOWEVER, THEY ARE AN INTEGRAL PART OF THE INFORMATION SYSTEM AND ASSIST IN PROCESSING THE PROPOSAL. SSN SOLICITED UNDER NSF ACT OF 1950, AS AMENDED.

0734894

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 04-23	FOR NSF USE ONLY
NSF 07-541 **04/10/07**	**NSF PROPOSAL NUMBER**

<div align="center">

NSF 07-541   **04/10/07**

FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S)   (Indicate the most specific unit known, i.e. program, division, etc.)

SES - Ethics and Values in Science, Engineering and Technology

NSF PROPOSAL NUMBER

0734879

</div>

DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION
04/10/2007	**2**	**04050000 SES**	**7915**	**002430742**	**05/29/2007 3:10pm S**

EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)	SHOW PREVIOUS AWARD NO. IF THIS IS ☐ A RENEWAL ☐ AN ACCOMPLISHMENT-BASED RENEWAL	IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ☐ NO ☒ IF YES, LIST ACRONYM(S)
141340095		

NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE	ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE
Rensselaer Polytechnic Institute	**Rensselaer Polytechnic Institute**
AWARDEE ORGANIZATION CODE (IF KNOWN)	**110 8th Street**
0028035000	**Troy, NY. 121803522**

NAME OF PERFORMING ORGANIZATION, IF DIFFERENT FROM ABOVE	ADDRESS OF PERFORMING ORGANIZATION, IF DIFFERENT, INCLUDING 9 DIGIT ZIP CODE
PERFORMING ORGANIZATION CODE (IF KNOWN)	

IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions)	☐ SMALL BUSINESS ☐ MINORITY BUSINESS ☐ IF THIS IS A PRELIMINARY PROPOSAL ☐ FOR-PROFIT ORGANIZATION ☐ WOMAN-OWNED BUSINESS THEN CHECK HERE

TITLE OF PROPOSED PROJECT   **Collaborative Research: Educational Simulation for Computing and Information Ethics**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
$ **60,001**	**36** months	**01/01/08**	

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW

☐ BEGINNING INVESTIGATOR (GPG I.A)

☐ DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C)

☐ PROPRIETARY & PRIVILEGED INFORMATION (GPG I.B, II.C.1.d)

☐ HISTORIC PLACES (GPG II.C.2.j)

☐ SMALL GRANT FOR EXPLOR. RESEARCH (SGER) (GPG II.D.1)

☐ VERTEBRATE ANIMALS (GPG II.D.5) IACUC App. Date _____

☒ HUMAN SUBJECTS (GPG II.D.6)

Exemption Subsection _____ or IRB App. Date **03/29/07**

☐ INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES INVOLVED

(GPG II.C.2.j)

_____

☐ HIGH RESOLUTION GRAPHICS/OTHER GRAPHICS WHERE EXACT COLOR REPRESENTATION IS REQUIRED FOR PROPER INTERPRETATION (GPG I.G.1)

PI/PD DEPARTMENT **Decision Sciences & Engineering Systems**	PI/PD POSTAL ADDRESS **110 8th Street DSES - CII 5015 Troy, NY 121803590 United States**
PI/PD FAX NUMBER **518-276-8227**	

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Electronic Mail Address
PI/PD NAME **William A Wallace**	**Ph.D.**	**1965**	**518-276-6854**	**wallaw@rpi.edu**
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				

Page 1 of 2   Electronic Signature

CERTIFICATION PAGE

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Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency?   Yes ☐   No ☒

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(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities,'' in accordance with its instructions.

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AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	SIGNATURE	DATE
NAME **Jennifer L Newnham**	**Electronic Signature**	**Apr 10 2007 1:50PM**
TELEPHONE NUMBER **518-276-6282**	ELECTRONIC MAIL ADDRESS **newnhj@rpi.edu**	FAX NUMBER **518-276-4820**

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0734879

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 04-23	FOR NSF USE ONLY
NSF 07-541 **04/10/07**	**NSF PROPOSAL NUMBER**

<div>

NSF 07-541   **04/10/07**

FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S)   (Indicate the most specific unit known, i.e. program, division, etc.)

SES - Ethics and Values in Science, Engineering and Technology

</div>

FOR NSF USE ONLY

NSF PROPOSAL NUMBER

0734899

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TITLE OF PROPOSED PROJECT **Collaborative Research: Educational Simulation for Computing and Information Ethics**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
$ **89,999**	**36** months	**01/01/08**	

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW

☒ BEGINNING INVESTIGATOR (GPG I.A)	☒ HUMAN SUBJECTS (GPG II.D.6)
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☐ PROPRIETARY & PRIVILEGED INFORMATION (GPG I.B, II.C.1.d)	☐ INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES INVOLVED
☐ HISTORIC PLACES (GPG II.C.2.j)	(GPG II.C.2.j)
☐ SMALL GRANT FOR EXPLOR. RESEARCH (SGER) (GPG II.D.1)	_____
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PI/PD DEPARTMENT **Computer Science**	PI/PD POSTAL ADDRESS **3399 North Road**
PI/PD FAX NUMBER **845-575-3218**	**Poughkeepsie, NY 126011387** **United States**

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CERTIFICATION PAGE

Certification for Authorized Organizational Representative or Individual Applicant:

By signing and submitting this proposal, the individual applicant or the authorized official of the applicant institution is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding debarment and suspension, drug-free workplace, and lobbying activities (see below), as set forth in Grant Proposal Guide (GPG), NSF 04-23. Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U. S. Code, Title 18, Section 1001).

In addition, if the applicant institution employs more than fifty persons, the authorized official of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of Grant Policy Manual Section 510; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflicts which cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

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By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Drug Free Work Place Certification contained in Appendix C of the Grant Proposal Guide.

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Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency?   Yes ☐   No ☒

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This certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding $100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000.

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The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

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AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	SIGNATURE	DATE
NAME **John T Ritschdorff**	**Electronic Signature**	**Apr 10 2007 4:50PM**

TELEPHONE NUMBER	ELECTRONIC MAIL ADDRESS	FAX NUMBER
845-575-3000	**john.ritschdorff@marist.edu**	**845-575-3478**

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Educational Simulation for Computing and Information Ethics
Project Summary (Combined Research and Education Project)

Modern global society is increasingly reliant on computing and information professionals to serve key roles in creating, managing, and maintaining the global computing and information infrastructure that is critical to research, education, commerce, and quality of life. As such, computing and information professionals need to learn not only technical skills but also how to resolve ethical issues such as in/outsourcing, intellectual property, and information privacy. Working in the new global economy requires that computing and information professionals are able to consider the range of cultural values and ethical perspectives as represented by leading thinkers such as Aristotle, Bentham, Buddha, Confucius, Gilligan, and Kant. To broaden and deepen the ethical perspectives of computing and information professionals, it is essential to develop and teach courses in computing and information ethics as part of professional graduate programs in computer science and the interdisciplinary information field. Further, to enable current and future computing and information professionals to appreciate and understand the relevance of ethics in their work, it is necessary to find educationally motivating ways to engage graduate students in professional computing and information programs to consider key ethical issues. This study proposes to accomplish this goal through development and evaluation of an educational simulation for computing and information ethics that serves as the cornerstone for an innovative course focusing on the role of values and ethics in computing and information within a global society.

This study builds on the PIs' prior research, including NSF-funded studies of the ethics of computational models and educational simulations, as well as developing and testing a web-based ethical assistant and "ethical" software agents. The PIs' expertise includes ethical implications of computing and information; development of software for simulating ethical decision making; and the ethics of modeling.

The proposed study answers three research questions: 1) How do graduate students in a computing and information ethics course use educational simulation software to gain understandings of and hands-on experiences with important computing and information ethics issues such as intellectual property in a global society? 2) Does geographical co-location have an impact on use of the simulation in the context of an internationally-oriented computing and information ethics graduate course with a diverse range of students? and 3) Do students in a graduate-level computing and information ethics course benefit most from interaction with peers, or with the software agents developed through this project?

To answer these important questions, the PIs propose a three-year study. The first year focuses on the initial development of the simulation and the innovative course. The second year involves evaluation and refinement of the simulation and course, including direct comparisons of individual and group use and online and face-to-face use of the simulation. In the third year, the PIs complete final versions of the simulation and course and implement both at additional institutions, by working with the advisory board, presenting workshops at major computing and information education conferences, and distributing the simulation via the web. The external evaluator will help assess the success of the simulation and course.

Intellectual Merit: First, this study contributes to computing and information ethics education through the development and evaluation of a novel simulation and course for computing and information ethics. Second, this study extends the research reported in the literature that compare face-to-face and online education by generating new data that explore the impact of geographical co-location versus online context on the effectiveness of using an educational simulation for computing and information ethics. Third, this study compares interaction with other people and interaction with software agents in the context of an educational simulation for computing and information ethics.

Broader Impacts: This study provides a free and open-source simulation for computing and information ethics, allowing students both to participate in and learn from cases and to develop and implement their own cases that they can then share with peers. It involves the development of a novel and highly participatory course built around the simulation that will be implemented in professional computing and information master's programs across the country and the world. This study better prepares computing and information professionals to deal with ethical issues throughout their careers. The study provides financial support and research training for two undergraduate and two doctoral students.

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Appendix Items:

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Educational Simulation for Computing and Information Ethics
Project Description

1.   Motivation

Imagine that you are a computing or information professional with a consulting business that helps other companies develop new software products. You have just accepted a contract with a software company, based in Greece, to assist in the development of a software product. Early on, you discover that their software appears to violate the patent of a rival company, based in India, whose software you are also involved in developing. How can you resolve this situation to protect the interests of both of your clients without violating 1) the non-disclosure agreements that you signed with each of these companies, 2) your professional code of ethics, or 3) your own personal sense of integrity?[1]

This case excerpt presents the reader with a potential ethical conundrum related to intellectual property within an international context. Unfortunately, computing and information professionals are ill-equipped in practice to deal with such scenarios. For example, Chuang and Chen (1999) found that in four different countries, including the US, computing and information professionals do not have sufficient educational opportunities to learn about computing and information ethics. It is important that students not only have the opportunity to learn about computing and information ethics, but also that they are exposed to a wide range of ethical perspectives (Clarkeburn et al. 2003). Computing and information professionals should be provided not only with technical training but also ethics education to prepare them to deal with computing and information ethics issues such as intellectual property, in/outsourcing, information privacy, and other ethical issues within an international context. One way to do this is to focus on the range of personal values seen as important in different cultures as well as to different people, and understand how these values are related to ethical decision-making.

In order to be successful in the delivery of ethics education, it is critical that professional Master's programs in computer science and the interdisciplinary information field[2] deliver engaging and substantive courses in computing and information ethics. To meet this need, this study involves the development and assessment of a computing and information ethics simulation focusing on ethical issues such as intellectual property within a global context. The design, development, and assessment of the simulation and the course occur incrementally, using the approach of user-centered design.

The first objective of this study is to build the simulation as part of an innovative course in computing and information ethics and support students' learning about others' values and ethical decision-making. The second objective is to determine the importance of geographical co-location of students using the simulation. The third objective is to compare the effectiveness of the simulation when used by students working with other students or individually, by interacting solely with software agents.

This proposal begins by reviewing the literature on developing an educational simulation for computing and information ethics; geography, culture, values and ethical decision-making; and learning about values and ethics from interacting with peers and ethical agents. The next sections detail relevant prior research projects by the PIs, including NSF-funded studies of the values embedded in computational models and the design and use of educational simulations, as well as research projects that result in ethical assistant software and "ethical" software agents. Next, the research questions and hypotheses are listed. After that, the research design is discussed in detail, including the design of the course, the simulation, and the cases, as well as the research team and advisory board, the sites, the research methods, the schedule, and the assessment strategy, including an external evaluator. Finally, the intellectual merit and broader impacts of the proposed research are discussed, along with an explanation of how the results of this work can be disseminated to directly influence ongoing research and educational efforts within the domain of ethics education, with an emphasis on computing and information ethics education.

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[1] This case excerpt was adapted from Burmeister (2000).
[2] Here, the interdisciplinary information field refers to a diverse yet related range of degree programs in information science, studies, systems, technology, management, and related fields.

2. Project Rationale

2.1 Developing an Educational Simulation for Computing and Information Ethics

Computing and information ethics education benefits greatly from the work of pioneers such as Walter Maner (1980), Deborah Johnson (2000), Richard Spinello (1995, 2006), Herman Tavani (2004), and Chuck Huff (2003). Another important influence is the ImpactCS project, which has developed three reports that emphasize the role of ethics in computer science education (Huff and Martin 1995, Martin et al. 1996, Martin and Weltz 1998). More specifically, building upon the moral psychology literature,[3] Huff and Frey (2005) outline how teaching with cases in technical courses can support teaching practical ethics, and show that ethical decision-making is not rule-based, but instead uses metaphor, analogy, and narrative. Thus, using the case method allows students to play different roles leading to different intuitions, provides bases for future analogies and metaphors, and allows "safe-but-realistic" practice. Keefer (2005) provides principles for educators derived from the problem- or inquiry-based learning literature,[4] and suggests that it is important to use authentic cases, to require students to make decisions, to encourage self-reflection, to connect cases to specific learning outcomes, and to use collaborative learning.[5] Loui (2005) provides four examples of good practice: parsing a large problem into "bite-size" pieces, adjusting presentation of material based on interactions with students, use of active learning, and facilitating student cooperation. The proposed study plans to apply all of these important insights.

The use of computers in higher education can have a range of positive impacts. Timmerman and Kruepke (2006) find that student performance gains with computer-aided instruction are larger than with traditional instruction. Computer simulations, in particular, can provide beneficial learning experiences. For example, a meta-analysis of the results of 32 studies shows that simulations provide significantly higher cognitive gains than traditional teaching methods (Vogel et al. 2006). Bergin et al. (2002) find that simulations are effective in involving students more actively than traditional case presentation methods that are paper-based. Simulations help students take perspectives, consider tradeoffs, and come up with creative solutions (Bos et al. 2006). Finally, Darabi et al. (2007) find that simulation use that involves interactive problem solving outperforms working out examples in class. As Shneiderman (2002: 222) argues, "simulations open up your mind to possibilities, allow you to explore safely, and enable you to see complex relationships." Simulations are thus ideal tools to use for teaching ethical decision-making.

Pioneering research is already being undertaken in the design and evaluation of ethics education support systems, which are computer programs that are designed to help students to understand and appreciate ethics.[6] While existing ethics education support systems make significant contributions to ethics education, new areas of research remain to be explored. For example, since these systems tend to have static HTML-based interfaces, one fruitful direction would be development of a dynamic system with the potential to embed more interactivity by using a programming language such as Java. Second, most of these systems are built solely for individual use and decision-making, leaving opportunities for

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[3] For example, see Blasi (1980), Callahan (1980), Colby and Damon (1992), Johnson (1993), Keefer and Ashley (2001), Lakoff and Johnson (1999), Matthews (1987), May (1996), Oliner and Oliner (1988), Pinkus et al. (1997), Pritchard (1998), Werhane (1999), and Weston (2001).

[4] For example, see Bereiter (1992), Bereiter and Scardamalia (1989), Brown and Campione (1994, 1996), Brown and Palincsar (1989), Cognition and Technology Group at Vanderbilt (1992, 1993), Keefer (2002), Keefer et al. (2000), May (1992, 1996), National Research Council (2000), Resnick et al. (1992), Resnick and Collins (1994), Savery and Duffy (1995), and Zeidler (2003).

[5] Descriptive ethics models help students understand the factors that may affect decision-making (Banerjee, Cronan, and Jones 1998, Bateman et al. 2003, Bommer et al. 1987, Brady 1985, Brass et al. 1998, Carroll 1989, 1990, 1996, Ferrell and Gresham 1985, Ferrell et al. 1989, Fritzsche 1991, Hunt and Vitell 1986, Jones 1991, Jones and Ryan 1997, Loch and Conger 1996, Malhotra and Miller 1998, McDevitt and Van Hise 2002, Stead et al. 1990, Street et al. 2001, Strong and Meyer 1992, Trevino 1986, van de Poel and Royakkers 2007, Wotruba 1990).

[6] For example, see Goldin et al. (2001), Gotterbarn (2004), Maner (1998, 2002), McLaren and Ashley (1995, 2000), Sherratt, Rogerson and Fairweather (2005), and van der Burg and van de Poel (2005).

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designing systems that allow groups of users to interact, or for individual users to interact with software agents, which could facilitate examination of ethical decision-making as a social process. Third, these systems have relatively simplistic and idealized relationships (if any) between values, criteria, principles, and decisions, rather than more complex and realistic relationships based upon empirically generated data. Fourth, these systems lack an iterative dimension, which would allow students to run and re-run a case to see how various combinations of individuals and their decisions within specific roles change the overall outcome. Fifth, these systems are not built primarily for use in conjunction with a computing and information ethics course. Finally, dissemination of these systems tends to be quite limited, which can be overcome through open-source distribution of software as well as accompanying course materials.

2.2   Geography, Culture, Values,[7] and Ethical Decision-Making

Both nationality and culture are linked to variations in ethical decision-making.[8] For example, Peppas (2002) finds significant differences in the ethical perspectives of Asians and Americans. Axinn et al. (2004) demonstrate the interconnectedness of culture and values. Recent research shows that there is a connection between personal and cultural values.[9] Further, recent research demonstrates that the effect of personal values across cultures affects ethical decision-making.[10] For example, Shafer et al. (2006) find differences among Americans and Chinese in their views regarding social responsibility and economic efficiency but also identify positive links between self-transcendence values and attitudes regarding socially responsibly behavior across the two countries. When comparing the values of people living in the US and the Middle East, Ford et al. (2005) discover that these two cultural groups differ significantly in terms of their social, political, and religious values. Students using a simulation could become more aware of these cultural differences; but whether it is more effective for students from different cultures to be geographically collocated or dispersed when using the simulation is an open question.

Overall, face-to-face and online education modes appear to be equivalent in terms of potential effectiveness. For example, a study comparing face-to-face and online education in career and technical education courses identifies no significant difference in student performance between online and campus courses (Benson et al. 2005). A survey comparing 532 faculty members' satisfaction finds that online

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[7] Values can be defined as "evaluative beliefs that synthesize affective and cognitive elements to orient people to the world in which they live" (Marini 2000: 2828). The Rokeach (1979) Values Survey and the Schwartz Values Survey (1992, 1994) are two of the most commonly used instruments for studying values. There is also a significant literature on the role of values in the design and use of technologies (Borning et al. 2005, Barr, Biddle, and Noble in press, Barr et al. 2006, Brey 2000, Burmeister 2000, Cockton 2004, 2005, Davis 2006, Davis et al. 2006, Ellul 1964, Fleischmann 2003, 2004, in press, Fleischmann and Wallace 2005, 2006, in press, under review, Friedman and Nissenbaum 1993, 1994, 1995, 1996, 1997, Friedman 1996, 1997, 2004, Friedman and Borning 2002, Friedman and Freier 2005, Friedman and Grudin 1998, Friedman, Howe, and Felten 2002, Friedman and Kahn 1992, 2000, 2003, Friedman, Kahn, and Borning 2006, Flanagan, Howe, and Nissenbaum 2005, 2006, Hess 1995, 2001, Introna and Nissenbaum 2000a, 2000b, Johnson 1997, Johnson and Mulvey 1995, Johnson and Nissenbaum 1995, Kling 1978, 1983a, 1983b, 1984a, 1984b, 1996b, Mumford 1934, 1970, Nissenbaum 1998a, 1998b, 2001, 2004, 2005, Pearl et al. 1990, Schuler 1996, Sclove 1995, Shneiderman 1990, 1995, 1999, Silver 2000, Star and Ruhleder 1996, Winner 1977, 1986, 1993)

[8] For example, see O'Fallon and Butterfield (2005), Ford and Richardson (1994), Ford et al. (2005), Sims (2006), Sims and Gegez (2004), Hisrich et al. (2003), Peppas (2002), Robertson et al. (2002), Aupperle (1984), and Ahmed et al. (2003).

[9] For example, see Fischer (2006), Fischer et al. (2007), Kemmelmeier et al. (2006), and Smith et al. (2002).

[10] Research also demonstrates the presence of a relationship between values and ethical decision-making in general (Abdolmohammadi and Baker 2006, Allen and Davis 1993, Ashkanasy et al. 2000, Connor and Becker 2004, Feather 1988, Fritzsche 1995, Fukukawa et al. 2007, Lin and Ding 2003, Robin, Reidenbach, and Forrest 1996, Roozen et al. 2001, Shafer et al. 2007, Singhapakdi and Vitell 1993).

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education performed better for five education goals, face-to-face education led to better results on three goals, and two goals were toss-ups (National Educational Association 2000). Stern (2004) argues that student motivation and course design are more important factors in determining educational effectiveness than the distinction between face-to-face and online learning. Finally, a study aiming to overcome limitations of previous research on this comparison finds that, in harmony with the existing literature, there is no significant difference in the effectiveness of face-to-face versus online education (Carey 2001).

However, a thorough examination of the relevant literatures does not reveal any studies that comparatively examine use of an educational simulation in both online and classroom-based courses. Thus, there appears to be a gap in the literature in terms of comparison of face-to-face versus online use of educational simulations. Certainly the above literature is a good starting point, but there is a need to conduct additional research to answer this question in the specific case of educational simulation use. Further, for the specific example of ethical decision-making, the literature on cultural values discussed above clearly indicates that there is likely to be a correlation between geographical co-location, as would be the case for face-to-face teaching, and similarity of values, especially if the online students are not geographically co-located. Thus, students in online courses may likely be exposed to a wider range of values, although this difference may be confounded by the compositions of the online and face-to-face courses, especially if face-to-face courses contain more international students than online courses, considering the large number of international graduate students in computer science and the information fields. Overall, geographical co-location and cultural values are important considerations for understanding use of the simulation in online and face-to-face courses. Indeed, these are understudied yet important in the context of an educational simulation or a course for computing and information ethics, providing a specific opportunity for improving the understanding of computing and information ethics education while also beginning a line of research that can be extended to other types of ethics education, as well as development and use of educational technology and educational evaluation in general.

2.3   Learning about Values and Ethics from Interacting with Peers and Ethical Agents
It is also important for this study to look at research to date on individual versus group learning, as well as learning that involves interaction with software rather than other people, a topic which has not received attention to date within the domain of computing and information ethics education. The literature on group learning, which includes sub-literatures on cooperative learning and collaborative learning, has found that group learning has an overall advantage over individual learning in a variety of aspects. Johnson et al. (1988) and Slavin (1980) both find that group learning is more effective not only for achievement but also for broader aspects of education. Skon et al. (1981) find that group use improved student learning in comparison with individual learning. A meta-analysis of 46 studies and 63 relevant findings focusing on individual and group learning concludes that 55 of the findings favored group use, while only eight of the findings favored individual use (Qin et al. 1995). A similar meta-analysis by Springer et al. (1999) finds that group learning led to significantly better learning outcomes than individual learning within the domain of science, technology, engineering, and mathematics education. The literature on individual learning versus group learning thus finds an overall advantage in favor of group learning; whether this applies to computing and information ethics education is an open question.

The literature on individual versus group use of educational simulations has also found an overall advantage in favor of group learning. For example, in a computer skills course at the undergraduate level, Keeler and Anson (1995) find that group use of educational simulations improves learning and reduces computer anxiety in comparison with individual use. Similarly, in a study of recursive programming, Jehng (1997) finds that group use led to better learning outcomes than individual use. By observing young students learning at computers in small groups, Crook (1994) finds that computers stimulate collaboration and social engagement. In a study of a high school physics class, Goldman (1996) concludes that group use of computers among students promotes active engagement with science.

The most interesting feature of the comparison of individual and group use of educational simulations is that while earlier studies demonstrate that there is a significant benefit to group use of educational simulations, the reality is that most educational simulations are designed for individual use. In

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addition, educators historically favor individual activities over group activities, especially in the case of computer use (Crook 1987). Indeed, educational simulations explicitly designed for group use are the exception (e.g., Tobin and Dawson 1992) rather than the rule. Johnson and Johnson (2004) list five reasons for educators' reluctance to use group learning: believing that students are meant to work individually; unwillingness to be responsible for others; not understanding how groups work; fear of failure of groups; and the time and effort necessary to incorporate group work. In the case of group use of educational simulations, a sixth factor should be considered: the human-computer interaction model of one user per computer. As a result, educators are reluctant to embrace group use of educational simulations. Clearly, researchers need to make educational simulation designers as well as educators aware of the data supporting group use of educational simulations. Further, it is important to extend this finding to the design and evaluation of an educational simulation for computing and information ethics.

This study extends research directions from the educational technology literature to computing and information ethics education. To date, software agents are primarily considered or used in a tutorial or supporting role.[11] Studies are now investigating sociability, personalization, believability and animation.[12] Agents are used to some extent in the development and evaluation of educational games.[13] Studies provide guidance for design and evaluation of such agents.[14] However, use of the multi-agent concept has been minimal.[15] In summary, most work with software agents in the educational technology community uses agents as tutors or assistants as opposed to participants in an interactive simulation. Thus, it is useful to investigate how users can interact with software agents in educational simulations, especially within the context of being exposed to different values and ethical decision-making rationales.

3.   Research to Date
This section summarizes four prior and ongoing research projects conducted by the PIs that directly contribute to this study. Specifically, the first subsection details an NSF-funded study by Fleischmann and Wallace of the ethical implications of values embedded in computational models. The second subsection describes NSF-funded research by Fleischmann on the design and use of educational simulations. The third subsection discusses research by Robbins and Wallace that involves developing and testing a web-based ethical assistant, while the fourth subsection shares research by Robbins and Wallace leading to developing and testing software-based "ethical" agents. All four of these projects make important contributions to the proposed research and demonstrate the complementary expertise of the research team.

3.1   Ethical Implications of Values Embedded in Computational Models
Two of the PIs of the proposed study, Fleischmann and Wallace, have an ongoing NSF-funded study that examines the role of human values in computational modeling. Specifically, this study focuses on how human values influence and are influenced by the design and use of computational models, how human values shape and are shaped by professional and organizational culture, and how these values determine

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[11] For example, see Aleven et al. (2004), Bello and Bringsjord (2003), Chou et al. (2003), Choy et al. (2005), Constantino-Gonzalez et al. (2002), Craig et al. (2004), Day et al. (2005), Dimitrova (2003), Holmes (2007), Hubal et al. (2001), Kabassi and Virvou (2003), Imberman (2005), Manos and Virvou (2003), Marin et al. (2004, 2005), Uresti and du Boulay (2004), Virvou and Alepis (2003), Virvou and Manos (2005), McLaren et al. (2005), Olguin et al. (2000), Soller et al. (2005), Tedesco (2003), Vizcaino (2005), Virvou et al. (2003), and Yang et al. (2005).
[12] For example, see Bull et al. (2003), Cooper (2003), de Carolis et al. (2006), Dirkin et al. (2005), Dunsworth and Atkinson (2005), Moundridou and Virvou (2002), and Robertson et al. (2004).
[13] For example, see Agostino et al. (2005), Virvou et al. (2002a, 2002b, 2004a, 2004b, 2005, 2006), and Virvou and Katsionis (2003).
[14] For example, see Amory (2001), Baylor (2001, 2004), Buendia-Garcia and Diaz (2003), Mahmood and Ferneley (2006), McNaught and Amory (2001), Robertson and Good (2003), Shifflet and Brown (2006), Shortridge and Sabo (2005), Westbrook and Braithewaite (2001), and Virvou et al. (2005).
[15] For example, see Baylor (2002), Baylor and Ebbers (2003), and Morozov et al. (2004).

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and are determined by the success of the computational modeling process and of computational models as products. This project builds upon earlier collaborations on the importance of transparency in the design and use of computational models (Fleischmann and Wallace 2005) and the ethics of modeling (Wallace and Fleischmann 2005), as well as twenty years of research by Wallace (1994) on the ethics of modeling.

The findings of this ongoing study (Fleischmann and Wallace 2006, in press, under review), which adopts a case study approach to data collection and analysis, support the need for the proposed study by demonstrating the importance of understanding ethics and values for a specific subset of computing and information professionals. Further, these results demonstrate that current educational efforts are not sufficient, as computational modelers feel that they have not had adequate opportunities for ethics education in their past experiences in computing and information degree programs. Finally, this prior research also contributes to the proposed study through the generation of cases to be used in the simulation, which grounds the simulation in empirical data from this research to date by two of the PIs.

3.2   Design and Use of Educational Simulations

PI Fleischmann's focus on the design and use of educational simulations began with an NSF Graduate Research Fellowship and an NSF Dissertation Research Improvement Grant. This NSF funding allowed Fleischmann to complete a case-study-based dissertation on the ethical, social, cultural, and political dimensions of the design and use of educational simulations. The results of this study (Fleischmann 2003, 2004, 2005, 2006a, 2006b, in press, under review) demonstrate that human values play an important role in the design and use of educational simulations. The study also identified online versus face-to-face use and individual versus group use of educational simulations as important areas for additional research, especially in the context of study of values and ethics related to computing and information education.

3.3   Developing and Testing the Ethical Assistant Software

A prior project by two of the PIs, Robbins and Wallace, involves developing and assessing a decision support system that helps a student consider an ethical problem from new and different perspectives (Robbins, Wallace, and Puka 2004). The decision aid is web-based and provides content that summarizes and simplifies five of the leading moral philosophies: the ethic of care (Gilligan 1977), egoism (Rand 1964), virtue ethics (Aristotle 350 BCE), categorical imperative (Kant 1785), and utilitarianism (Bentham 1789, Mill 1863). The intent was to make the philosophies transparent, as suggested by Fleischmann and Wallace (2005). The specific ethical dilemma used was the Pharmanet case (Chee and Schneberger 1998, Schneberger and Chee 1999), which asks a reader to consider how to handle the prospective implementation of a widely accessible database of pharmacy prescription records.

This prior research demonstrates that web-based ethical decision aids can be built and used, and can improve the decision-making of students confronted with cases in a laboratory environment (Robbins et al. 2004) and reports information about the relationships among value types, ethical ideology dimensions, reasoning criteria, and decisions made by individuals resolving an ethical dilemma (Robbins 2005). This prior research contributes to the proposed study by serving as a roadmap for developing the educational simulation and identifying relationships between specific ethical decisions and values.

3.4   Developing and Testing Ethical Software Agents

Another important prior study by Robbins and Wallace involves the design, development, verification, and validation of a computational model of a group of software agents solving an ethical problem (Robbins 2005). For this study, the software agent paradigm is used in tandem with the concept of practical reasoning (Wellman 1999, Wallace 2001). In the context of artificial intelligence, an agent is a computer system that is capable of autonomous action and that interacts with other agents (Wellman 1999). Resolving ethical problems requires considering criteria, autonomy and sometimes, interaction. Software agents can consider criteria, act autonomously, and interact with other agents (virtual or human).

This research demonstrates that a software agent can mimic the practical reasoning-based resolution of an ethical dilemma (Robbins 2005) and contributes to the proposed study by serving as a prototype for the agents to be used in the simulation. These agents are based upon the practical

application of moral philosophies explored in this research, including ethics of care, egoism, virtue ethics, the categorical imperative, and utilitarianism. These agents allow individual users to run the simulation in a simulated group setting and also allow users to learn about the effects of interacting "ethical" agents.

4.   Research Questions (RQs) and Hypotheses (Hs)

RQ1   How and why do graduate students in a computing and information ethics class use educational simulation software to gain understandings of and hands-on experiences with important computing and information ethics issues such as intellectual property in a global society?

H1a   Graduate students can use the simulation software to better understand moral philosophies.

H1b   Graduate students can use the simulation software to better understand the relationship between their own and others' values and ethical decision-making.

RQ2   Does geographical co-location have an impact on graduate students' use of the simulation in the context of an internationally-oriented information ethics course?

H2a   Geographical co-location is more effective [than geographical dispersion] for graduate students learning about moral philosophies.

H2b   Geographical co-location is more effective [than geographical dispersion] for graduate students learning about relationships among values and reasoning criteria, reasoning criteria and decisions, and values and decisions.

RQ3   Do graduate students benefit most from interaction with peers, or with the software agents developed through this project?

H3a   Graduate students benefit more from interaction with peers [than with software agents] when learning about the relationships among values and reasoning criteria, reasoning criteria and decisions, and values and decisions.

H3b   Graduate students benefit more from interaction with software agents [than with peers] when learning about moral philosophies.

5.   Project Plan

This study involves user-centered design of an educational simulation as part of a new type of course in computing and information ethics education. This section outlines the course, the software, and the foci of the cases used in the software. It also describes the research team that is conducting the study, the primary sites where the software is used and assessed and the students who use and assess the software, the research methods to be used for data collection and analysis, the schedule, and the assessment strategy.

5.1   The Course

This study involves the development of a course on computing and information ethics that is novel in terms of the mechanism through which it is taught (the educational simulation to be developed), the range of timely and appropriate content areas (including particular emphasis on current issues such as intellectual property), and the international scope of the course (building on the notion of ethics and values as culturally constructed). This course places special emphasis on the mutually constitutive relationship between information technologies and human values, as well as the culturally situated nature of both information technologies and human values. In teaching this course, the PIs create an environment that allows graduate students to share their diverse cultural values and ethical decision-making processes by designing the simulation and the course for a multicultural audience. This course serves to situate key ethical issues related to computing and information ethics, such as intellectual property, in an international context. The initial course uses Mason's (1994) covenants with reality and values as well as Fleischmann and Wallace's (2005) covenant with transparency. It also builds upon Mason's (1986) four issues of the information age: privacy, accuracy, property and accessibility. A list of the course topics is provided in Table 1 to give an overview of the content of the initial design of the course.[16]

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[16] The course, like the simulation, is refined over the duration of the study through refinements based on an iterative process of development and evaluation.

Topic 1	Technologies and Values as Culture-Specific
Topic 2	Ethical Implications of the Global Computing and Information Economy
Topic 3	Overview of Ethical Theories
Topic 4	Covenants with Reality, Values, and Transparency
Topic 5	Censorship
Topic 6	Intellectual Property
Topic 7	Stealing and Sharing Information
Topic 8	Information Privacy
Topic 9	Information Security
Topic 10	Software Reliability and Accountability
Topic 11	Globalization
Topic 12	Outsourcing
Topic 13	The Global Digital Divide
Topic 14	Professional Ethics

Table 1: Initial List of Topics for the Computing and Information Ethics Course

5.2   The Software: SIMULATE

Simulation for [Computing] and Information Master's [Students] to Understand, Learn, and Apply Teamwork and Ethics (SIMULATE), is a case-based learning tool that allows students to work individually or in groups including other students and/or software agents to resolve ethical dilemmas. SIMULATE presents students with ethical dilemmas and students then choose to take one or more roles within the case or assign the roles to software agents that represent specific ethical perspectives. SIMULATE can be used in face-to-face or in online courses and exposes students to a variety of ethical principles, but also creates an environment where students can consider the relationships of values and ethical decision-making. The process that students use to interact with SIMULATE is shown in Figure 1. Please note that although the software has robust technical capabilities such as allowing mixed groups of multiple students and multiple agents, as well as allowing students to play multiple roles or to observe the decisions of other students and/or agents, the evaluation of SIMULATE in this study focuses on direct comparison of individual use of SIMULATE by a single student interacting with software agents and group use of SIMULATE by groups of students each playing different roles. Study of other combinations of students and/or agents is beyond the scope of this study given limitations in time and funding, however there is great potential for additional research on these mixed and alternative modes of using SIMULATE, especially given that SIMULATE is to be freely distributed as open-source software for other researchers and educators to use, modify, and evaluate in subsequent studies. SIMULATE can also have a simple user interface, allowing ethics educators in other fields to enter additional non-computing and information ethics cases (e.g., biology, engineering) into the simulation for use in their ethics classes.
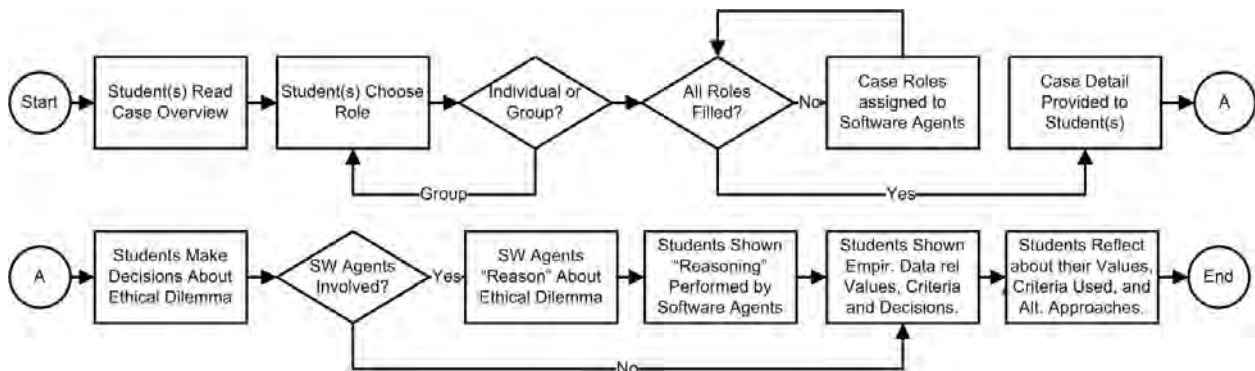

Figure 1: Process that Students Use to Interact with SIMULATE

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Use of SIMULATE begins with a brief description of the roles available within a specific case. Each student can select a role. For exposition purposes, we now refer to the Pharmanet case (Chee and Schneberger 1998, Schneberger and Chee 1999) that centers upon patrons' privacy, social benefits, and rights of professionals in the context of the hypothetical implementation a province-wide pharmacy prescription record database in British Columbia. In this case, the roles include the Minister of Health, the president of the British Columbia Civil Liberties Association, the project manager of the Pharmanet implementation project, and the president of the Pharmacists' Association. Students either interact with their peers with multiple students playing the various roles in the case or an individual student can select software agents to play roles in the case. The software agents represent a wide range of ethical perspectives from across the globe such as Aristotle, Confucius, Buddha, Kant, Bentham, and Gilligan. The student is then presented with a brief description of a case related to computing and information ethics. Again, using the Pharmanet case, the student is briefed as to the context (1994, British Columbia) and the benefits or risks for various stakeholders (decreased adverse drug interactions, reduced fraudulent prescription fills for illegal uses, and streamlined billing) as well as concerns of the various roles (balancing multiple factors, intrusion into professional practices).

Next, the student is asked to make an ethical choice based upon the role and case provided. Based on the student's answer, the next screen provides feedback to individual students about the values embedded in their answers, helps them understand their decision, and explains how their decision is related to their values. This interaction stimulates users to think about criteria they use to draw conclusions. The simulation also shares with the users an empirical finding from an earlier experiment. The linking of the criteria used and associated values encourages thought about the linkages of personal values and the use of criteria when resolving ethical conflicts.

SIMULATE then shows the student the choices faced by other students (or software agents), their decisions made, and a reporting of the empirical relationship between the decisions made, values, criteria used, and/or the built-in "reasoning" of software agents based upon moral philosophies. Finally, the overall outcome of the scenario is displayed, with an explanation of how this outcome was a result of the decisions made by the different roles in the case, which were played by students or software agents.

The programming environment used to create SIMULATE is the Java programming language and JADEX BDI Agents. Advantages of Java and JADEX include cross-platform compatibility, suitability for the development, documentation, and extension of open-source freeware, the widespread use of Java, and Java's libraries of graphical user interface (GUI) source code. SIMULATE is to be made available to other educators and students as open-source freeware, allowing them to freely download, configure, use, and modify the software, and Java is suitable for this purpose because tools for Java software development are freely available on the Sun Microsystems website. Finally, Java has built-in capabilities to build GUI features, making SIMULATE easier and more enjoyable to use.

5.3 The Cases: Access, Ownership, Earning, Privacy, and Quality

A key component of SIMULATE is the library of cases that support the use of the software. The development of a range of short cases with accompanying roles is one of the significant aspects of the creation of SIMULATE. In addition, SIMULATE provides data to students about past student's values, criteria, and decisions about these cases. SIMULATE's cases are developed from several sources. While each case has a focal topic (see Table 1), each also ensures the opportunity for the student to consider multiple ethical perspectives in the frame of the covenants with reality, values, and transparency.

One important case for this study is the Pharmanet case (Chee and Schneberger 1998, Schneberger and Chee 1999). Based upon empirical data from research to date by the PIs, the major issues in this case include personal privacy, the opportunity to reduce adverse drug interactions and illegal prescription refills, and the potential effect of this system on the professional practices of pharmacists. Extensive research has been performed on this case to link value types, ethical ideology dimensions, reasoning criteria, and decisions (Robbins et al. 2004, Robbins 2005, Robbins and Wallace in press). Based on these data, it is possible to provide students with empirically validated analysis of others who came to the same decisions and how this information might stimulate a student's self-reflection about

values and ethical reasoning. By providing students with the results of these analyses, it is hypothesized that students are able to better understand the relationships between their own values and use of criteria, as well as begin considering the diversity of possible values, reasoning criteria, and potential decisions in any ethical dilemma. The students also benefit when they see traditional moral philosophic approaches dynamically applied when software agents play case roles.

The computing and information ethics literature is another source for cases.[17] During the study, data are collected about student values types, reasoning criteria, and decisions, making it possible to connect decisions to these other factors as was performed in the Pharmanet case described above.

Finally, many of the cases used in SIMULATE are developed based on data from an ongoing NSF-funded study that is being conducted by two of the PIs of this proposal (Fleischmann and Wallace). As discussed above, this study involves multi-method investigation of computational modeling within different organizational cultures. Data collection has already been completed for the corporate research laboratory and is underway for the academic and government research laboratories. Additional cases based on these data can be incorporated into SIMULATE. For example, one case would present students with an ethical dilemma in which an employee must decide how to confront racism related to outsourcing. Another case would ask the student about the balance between honesty and self-censorship in choosing whether or not to present a direct superior with disappointing news about the accuracy of a computational model. These cases can allow the researchers to apply their own findings to developing educational cases that are useful both within and beyond SIMULATE.

5.4   List of Key Personnel: The PIs, Students, Advisory Board, and External Evaluator
This project is led by a research team of three PIs at three different institutions with extensive experience in conducting collaborative research projects involving two or three members of the research team (e.g., Kelton, Fleischmann, and Wallace in press, Fleischmann and Wallace 2005, 2006, in press, under review, Robbins, Fleischmann, and Wallace under review, Robbins and Wallace in press, Robbins, Wallace, and Puka 2004, Wallace and Fleischmann 2005, Willemain et al. 2003). Collectively, the three PIs hold ten degrees in nine fields: computer science, anthropology, science and technology studies, finance, accounting, information technology, engineering science, chemical engineering, and management science. Two of the PIs (Fleischmann and Wallace) have prior funding from NSF, both individually and collaboratively.

PI Kenneth R. Fleischmann is an assistant professor in the College of Information Studies of the University of Maryland, College Park. He is also a member of the Human-Computer Interaction Laboratory of the University of Maryland. His doctoral dissertation, "Exploring the Design-Use Interface: The Agency of Boundary Objects in Educational Technology," examined the values embedded in educational computer simulations and their ethical implications, was funded by an NSF Graduate Research Fellowship and an NSF Dissertation Research Improvement Grant, and so far has directly led to five peer-reviewed journal articles to date (Fleischmann 2003, 2005, 2006a, 2006b, in press). He also has experience teaching information ethics at the graduate level.

PI Russell W. Robbins is an assistant professor in the School of Computer Science and Mathematics of Marist College. His doctoral thesis, "Understanding Individual and Group Ethical Problem Solving: A Computational Ethics Approach," involved the development of two important software products, the ethical assistant and "ethical" agents, and understanding 30 prescriptive and descriptive ethics theories. His professional experience includes eight years of teaching, four years of employment at IBM, and co-founding and serving as president of a company that developed information systems for agencies that serve individuals with developmental disabilities.

PI William A. Wallace is a professor in the Department of Decision Sciences and Engineering Systems at Rensselaer Polytechnic Institute. He has over forty years of professional experience as a

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[17] For example, see Burmeister (2000), Johnson (2000), Johnson and Nissenbaum (1995), Schultz (2006), Spinello (2002), Spinello and Tavani (2004), Tavani (2004), as well as websites that contain cases for computing and information ethics such as www.onlineethics.org and computingcases.org.

computational modeler, and has conducted research on the ethics of modeling for over twenty years. Wallace has received extensive support from the National Science Foundation on research projects including the ethics of modeling, and results from this funding include an edited volume, *Ethics of Modeling*, and an interactive distance video workshop on the same topic. Wallace is also co-founder and editor emeritus of the journal *Computational and Mathematical Organizational Theory*. Wallace's extensive experience as a researcher and educator and his influential research in computing and information ethics serve as vital assets for this study.

This study also provides training and financial support for two doctoral students and two undergraduate students. At the University of Maryland, one doctoral student is supported for two academic years and three summers. At Rensselaer Polytechnic Institute, one doctoral student is supported for three summers. At Marist College, two undergraduate students are supported for one year each. The doctoral students receive training in interface design, creating a literature review, writing ethics cases, course development, and quantitative and qualitative data collection and analysis. The undergraduate students receive training and practical experience in requirements analysis, user-centered design, object- and agent-oriented programming, software reviews, and acceptance testing. Strong efforts are made to recruit students from underrepresented minority groups to serve as members of the research team.

An advisory board provides the research team with continuous feedback used to improve and refine the study. The advisory board meets with the assembled research team once per year at the University of Maryland to provide feedback on the progress made in the past year and the activities planned for the next year. The advisory board represents a range of expertise within the domains of ethics education and computing and information ethics. PI Wallace serves as the liaison between the research team and the advisory board, which includes Deborah Johnson, Keith Miller, and Ben Shneiderman.

Deborah G. Johnson is the Anne Shirley Carter Olsson Professor of Applied Ethics at the School of Engineering and Applied Science at the University of Virginia. She is a philosopher specializing in practical and professional ethics, focusing in particular on the ethical and policy issues surrounding computer and information technology. She is the author/editor of six books, including the popular textbook Computer Ethics, which is now in its third edition, and has written over 60 published papers. She co-edits *Ethics and Information Technology*. She is a past president of the Society for Philosophy and Technology as well as the International Society for Ethics and Information Technology (INSEIT).

Keith W. Miller is a Professor of Computer Science at the University of Illinois at Springfield. He has published research on the topics of computer ethics education, online education, and moral agents. He has also conducted NSF-funded research in the area of computer ethics education. Graduate computer science courses that he has taught include Ethics of Computing and Computers, Security, and Ethics. He has recently been appointed as the Senior Associate Editor of IEEE Technology & Society, and takes over as the Editor-In-Chief in December 2007.

Ben Shneiderman is Professor of Computer Science, Founding Director (1983-2000) of the Human-Computer Interaction Laboratory, and Member of the Institute for Advanced Computer Studies and the Institute for Systems Research, all at the University of Maryland at College Park. He is a Fellow of the ACM and the AAAS, and received the ACM CHI (Computer Human Interaction) Lifetime Achievement Award in 2001. His book *Leonardo's Laptop: Human Needs and the New Computing Technologies* won the IEEE 2003 award for Distinguished Literary Contribution. He has co-authored two textbooks, edited three technical books, and published more than 200 technical papers and book chapters.

Finally, as the external evaluator, Davina Pruitt-Mentle provides an outside perspective on the success of the simulation and the course. She is the Director for Educational Technology Policy, Research, and Outreach within the College of Education of the University of Maryland, and Director of the Cyberethics, Cybersafety, & Cybersecurity (C3) Institute. She has extensive experience in the research, development, and delivery of educational media, including computer software, multimedia, distance learning, and print materials. She teaches graduate courses on a wide range of technology-related topics, including cyberethics. She has also been appointed to serve on the K-16 Maryland Committee on Library Information Literacy and Ethical Use. She is to complete and defend her doctoral dissertation in educational technology policy at the University of Maryland in the summer of 2007.

5.5   List of Partnering Organizations: Maryland, Marist, and Rensselaer

The partnering organizations are the University of Maryland (the College of Information Studies and the Cyberthics, Cybersafety, & Cybersecurity Institute), Marist College, and Rensselaer Polytechnic Institute. Letters from the partnering organizations are appended as supplementary documents to the proposal.

The simulation and course are tested in five professional graduate programs in three institutions: the Master's in Information Management and Master's of Library Science programs at the University of Maryland, a public research university; the Master's of Computer Science and Master's of Information Systems programs at Marist College, a primarily undergraduate institution; and the Master's in Information Technology program at Rensselaer Polytechnic Institute, a private technological institution.

It is also important to implement and evaluate SIMULATE and the affiliated course at additional research sites. The advisory board, presentations and workshops at conferences, and web portals all help to publicize SIMULATE and the course, making it possible to encourage diffusion of SIMULATE to additional institutions and Master's programs. Through these opportunities, educators at other institutions are encouraged to adopt the course and the SIMULATE software and to revise them to fit their needs.

5.6   Evaluation Plan

Three types of assessment are used to evaluate the project. First, the advisory board gives guidance about the ongoing process, by reviewing the progress to date in the previous year and the planned activities for the following year. Second, the external evaluator evaluates the educational effectiveness of SIMULATE and the course (see Figure 2). Finally, the peer review process at journals and conferences provides validation of the research. The three components of the assessment strategy are interconnected and synergistic, and provide complementary feedback to the research team throughout the study.
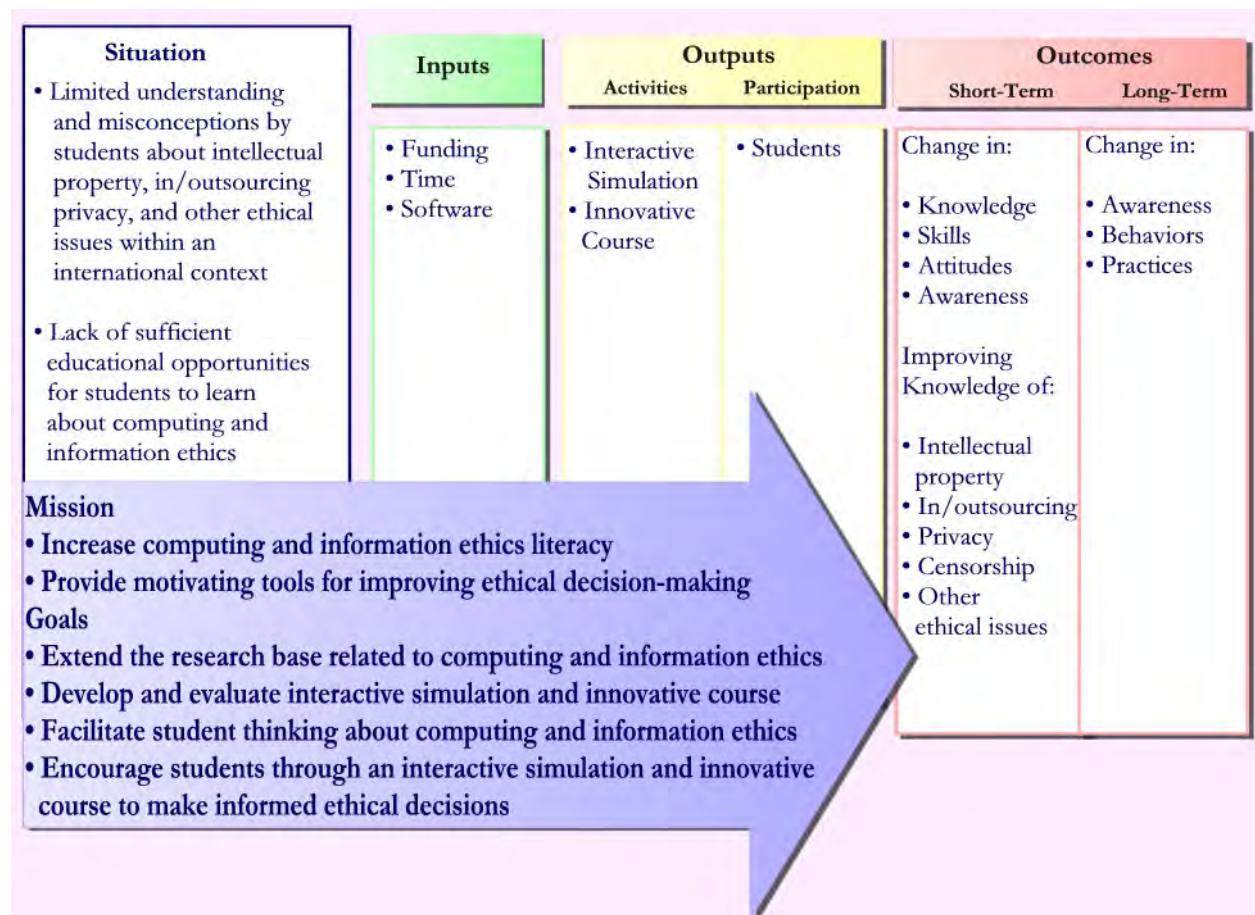

Figure 2: Evaluation Plan for the Simulation and the Course

Focus groups of students in computing and information ethics courses are used to collect data about the course and SIMULATE throughout this study (Stewart et al. 2006). Focus groups of 4-6 students are asked to react to an interface mockup, cases to be used in SIMULATE, and procedures for using SIMULATE in courses. Focus group transcripts are generated by the students and analyzed by the PIs. Insights from focus groups are incorporated into each (re)design of SIMULATE and the course.

Preliminary testing provides additional user input (Dix et al. 1993, Preece et al. 2002, Shneiderman and Plaisant 2004, Virvou and Tsiriga 2000) about the software at various stages of the simulation development, from initial prototypes to the final software. Data collected in the usability laboratory environment include quantitative and qualitative user feedback on various aspects of usability, accessibility, and functionality of the simulation, as well as use of the think-aloud protocol (Ericsson and Simon 1993, Massey and Wallace 1996) that provides data on user experience with the simulation.

In addition, data are collected at the beginning and end of each course (Hashemian and Loui 2005), including questions about the course as a whole; about the usefulness of SIMULATE within the course; about the usefulness of the course readings, class discussions, and supplemental materials; and about overall assessment of the course. Pre- and post-tests and pre- and post-surveys (Self and Ellison 1998, Sindelar et al. 2003) are used to measure the impact of SIMULATE on learning and attitudes.

Data analysis for this study includes quantitative, qualitative, and mixed-method analysis. Quantitative analysis involves the use of appropriate statistical methods, including but not limited to ANOVA, t-tests, and Mann-Whitney U. Qualitative analysis uses grounded theory (Glaser and Strauss 1967, Strauss and Corbin 1998). Mixed-method analysis consists of coding open-ended answers for specific features such as evidence of ethical reasoning or consideration of the values of others, then counting the frequency of different coded answer types, and finally performing appropriate statistical analyses on these counts along with inter-rater reliability, including Cohen's (1960, 1968) Kappa and Perrault and Leigh's (1989) reliability coefficient (Robbins et al. 2004, Robbins 2005).

5.7   Project Management Plan

SIMULATE and the computing and information ethics course in which it is embedded course co-evolve during this three-year study. Table 2 lists the schedule for completing the study.

Semester	Computing & Information Ethics Course	SIMULATE Software
Spring 2008	Teach Information Ethics at Maryland and Marist (Fleischmann & Robbins)	Conduct Focus Groups (Fleischmann & Robbins)
Summer 2008	Refine based on Spring 2008 results (Fleischmann, Robbins, & Wallace)	Develop Alpha Version (Robbins, Fleischmann, & Wallace)
Fall 2008	Teach at Maryland w/ the Alpha Version (Fleischmann)	Test Alpha Version (Fleischmann) Develop Beta Version (Robbins)
Spring 2009	Teach at Maryland w/ the Beta Version (Fleischmann)	Test Beta Version (Fleischmann) Work on Final Version (Robbins)
Summer 2009	Refine to better integrate w/ SIMULATE (Fleischmann, Robbins, & Wallace)	Complete Final Version (Robbins, Fleischmann, & Wallace)
Fall 2009	Teach at Maryland, Marist, & Rensselaer (Fleischmann, Robbins, & Wallace)	Test Final Version (Fleischmann, Robbins, & Wallace)
Spring 2010	Teach at Maryland, Marist, & Rensselaer (Fleischmann, Robbins, & Wallace)	Test Final Version (Fleischmann, Robbins, & Wallace)
Summer 2010	Distribute via Educational Portals (Fleischmann, Robbins, & Wallace)	Distribute via Educational Portals (Fleischmann, Robbins, & Wallace)
Fall 2010	Teach at Other Institutions (Wallace, Fleischmann, & Robbins)	Test at Other Institutions (Wallace, Fleischmann, & Robbins)

Table 2: Schedule for Creating SIMULATE and the Course

5.8   Plan for Dissemination of Results

Research findings are submitted to peer-reviewed journals such as *Communications of the ACM*, *Journal of the American Society for Information Science & Technology*, *MIS Quarterly*, *IEEE Transactions on Systems, Man, and Cybernetics*, *Journal of Information Ethics*, and *Ethics and Information Technology*. Educational findings are submitted to *Computer Science Education*, *The ACM Journal on Education Resources in Computing*, *Journal of Information Technology* Education, and *Journal of Education for Library and Information Science*. Refereed papers and workshops are presented at annual meetings of the American Society for Information Science and Technology, the Association for Information Systems, and the Association for Computing Machinery Special Interest Groups for Computer Science Education and Information Technology Education. The workshops are important for disseminating findings of the study and assisting in recruitment of additional sites for further use and testing of SIMULATE and the course.

The advisory board will also play an important role in dissemination. Advisory board members plan to implement the simulation and the course in their own teaching where possible, and also can encourage their colleagues to use the simulation and the course. The PIs, especially PI Wallace, further disseminate SIMULATE and the course by traveling to other institutions of higher education first to encourage use of SIMULATE and the course and then to guest lecture within similar courses started at other institutions through the dissemination efforts of this study and to observe use of SIMULATE within these different educational settings. As open-source software, SIMULATE can be linked to from a range of sites such as www.onlineethics.org, computingcases.org, www.merlot.org, and sourceforge.net.

6   Intellectual Merit

This study aims to contribute to the computing and information ethics education and ethics education support systems literatures by incrementally and iteratively building, using, and assessing an educational simulation for computing and information ethics and a course built to support repeated and varied use and study of use of the simulation. By so doing, the study demonstrates how students use the simulation when learning about ethics. Specifically, it shows how students can learn about the leading ethical approaches as well as their own values and the values of others, especially including fellow students from other cultures. It also examines the empirical relationships between values, criteria used by students to solve ethical problems, and the decisions these students arrived at when using the simulation. These insights can deepen our understanding of the relationship between ethical problem-solving and cultural values.

Another area of contribution of the study is to extend the research reported in the literature that compare face-to-face and online education by generating new data that explore the impact of geographical co-location versus online context on the effectiveness of using an educational simulation for computing and information ethics. Thus, this study adds an important and currently missing piece to the literature on computing and information ethics education through testing of educational simulation use both face-to-face and online which also has implications for ethics education and educational technology design and use broadly conceived.

A third contribution of the study is to compare use of an educational simulation for computing and information ethics that involves interaction with other people and interaction with software agents. This contribution is accomplished through development of novel software agents that represent established ethical perspectives. The agent version is compared to a version that involves students working in groups. As a result, the study provides valuable data and insights comparing interaction with other people and with software agents. The study also provides valuable data regarding using software agents as virtual characters in simulation games as opposed to as tutors or similar roles. As such, this study can revolutionize research and education within the domain of educational simulations for computing and information ethics and also impact ethics education and educational technology in general.

7   Broader Impacts

The most tangible impact of this study is the development of SIMULATE as documented open-source freeware available to all interested educators and students via the Internet. Not only can SIMULATE be used for teaching computing and information ethics but also, because it is distributed as open-source

software and designed to allow input of user-developed cases, it is easily applied to other domains of ethics education in science and engineering, such as through collaboration with the Maryland Initiative on Research Ethics (see attached letter of support from Dr. Sandra Greer, PI of this funded EESE project).

The second broader impact of this study is the development of an innovative course for computing and information ethics. All resources used to teach this course, including the syllabus, potential case videos, discussion topics, anonymous records of debates, online presentation slides, etc., are distributed via the web portal created as part of this study and through the sites listed above. Thus, the materials are tested in real courses in multiple educational settings broadly available to any interested educators and students across the USA and around the world, as well as to researchers interested in extending the functionality of and further evaluating SIMULATE.

By providing the online simulation and additional educational resources for teaching computing and information ethics, this research aims to better prepare diverse, internationally-focused computing and information professionals. These materials are useful in increasing emphasis on ethics for professional Master's students in computer science and information fields, preparing these students to face ethical issues during their computing- and information-oriented careers in a global economy. It is important to note that this research also provides funding for two doctoral students and two undergraduate students within computing and information programs, and strong efforts are made to recruit students from underrepresented minority groups to serve as members of the research team.

Results from Prior Relevant NSF Support for Kenneth R. Fleischmann: Dissertation Research: Designing from Below: Embedding Knowledges and Values in Educational Simulations (SES-0217996); PI: David J. Hess; Co-PI: Kenneth R. Fleischmann; Period of Funding: 07/15/02 to 06/30/04 (including one year of no-cost extension); Funding Awarded: $7,990.

This study identifies that that values play an important role in the design and use of educational simulations. For example, packaging, promotional materials, and even the interfaces with frog bodies can contain embedded animal advocacy values, through terms such as "frog-friendly software" or an interface that involves building, rather than cutting into, a frog body (Fleischmann 2003). The study also finds that users can indeed become designers, as in the case of biology teachers who become simulation designers (Fleischmann 2006a). Educational simulations also shape and are shaped by educational standards, including the increasing reliance on science and technology standards (Fleischmann in press). This study also identifies online versus face-to-face use and group versus individual use as important factors in educational simulation use, and argues that educational simulations should be designed to take these important factors into consideration (Fleischmann 2005). Overall, this research contributes of a new methodological approach, the boundary objects with agency framework, which can be applied to other problems in computer science and the information field (Fleischmann 2006b). In addition to these five solo-authored peer-reviewed journal articles, the products of this study also include a doctoral dissertation (Fleischmann 2004) and four refereed conference presentations.

Results from Prior Relevant NSF Support for William A. Wallace: ITR: Trust and the Information Consumer: A Graph Theory Approach (IIS-0081219); PI: W.A. Wallace; Co-PI: K. Carley (Carnegie Mellon University), Period of Funding: 09/01/00 to 08/30/04, (including one year of no-cost extension); Funding Awarded: $468,452.

This study involves development of software to implement a meta-graph methodology for constructing consensus graphs from collections of graphs, a virtual experiment to examine computational aspects of the methodology, and a subjective evaluation study to determine the validity of the results in representing consensus knowledge. Another important outcome of this completed project is research training for three graduate students. Results of this completed project include three peer-reviewed journal articles published or in press (Chopra and Wallace 2000, Fleischmann and Wallace 2005, Kelton, Fleischmann, and Wallace in press), two book chapters (Chopra, Mendonça, Rush, and Wallace 2000, Wallace and Fleischmann 2005), a doctoral dissertation (Chopra 2001), and four refereed conference presentations, including three published in proceedings (Chopra and Wallace 2001, 2002, 2003).

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Biographical Sketch for Kenneth R. Fleischmann

a. Professional Preparation.

Case Western Reserve University	Anthropology and Computer Science	B.A., 1999
Rensselaer Polytechnic Institute	Science and Technology Studies	M.S., 2002
Rensselaer Polytechnic Institute	Science and Technology Studies	Ph.D., 2004

b. Appointments.

University of Maryland   Assistant Professor   January 2007 - present
College of Information Studies (and member, Human-Computer Interaction Lab)

Drexel University   Visiting Assistant Professor   Fall 2006
College of Information Science and Technology

Florida State University   Assistant Professor (on leave 2006-2007)   2004-2007
College of Information

c. Publications.

(i) related publications

Fleischmann, K.R. & Wallace, W.A. In Press. "Ensuring Transparency in Computational Modeling: How and Why Modelers Make Models Transparent." Forthcoming in *Communications of the ACM*.

Kelton, K., **Fleischmann, K.R.**, & Wallace, W.A. In Press. "Trust in Digital Information." Forthcoming in *Journal of the American Society for Information Science and Technology*.

Fleischmann, K.R. In Press. "Standardization from Below: Science and Technology Standards and Educational Software." Forthcoming in *Educational Technology & Society*.

Wallace, W.A. & **Fleischmann, K.R.** 2005. "Models and Modeling." In *Encyclopedia of Science, Technology, and Ethics*, Edited by Carl Mitcham. Macmillan Reference.

Fleischmann, K.R. & Wallace, W.A. 2005. "A Covenant with Transparency: Opening the Black Box of Models." *Communications of the ACM* 48(5): 93-97.

(ii) other significant publications

Fleischmann, K.R. In Press. "Digital Libraries with Embedded Values: Combining Insights from LIS and Science and Technology Studies." Forthcoming in *Library Quarterly*.

Fleischmann, K.R. 2006. "Do-It-Yourself Information Technology: Role Hybridization and the Design-Use Interface." *Journal of the American Society for Information Science and Technology* 57(1): 87-95.

Fleischmann, K.R. 2006. "Boundary Objects with Agency: A Method for Studying the Design-Use Interface." *The Information Society* 22(2): 77-87.

Fleischmann, K.R. 2005. "Virtual Dissection and Physical Collaboration." *First Monday* 10(5).

Willemain, T.R., Wallace, W.A., **Fleischmann, K.R.**, Waisel, L.B., & Ganaway, S.N. 2003. "Bad Numbers: Coping with Flawed Decision Support." *JORS: The Journal of the Operational Research Society* 54(9): 949-957.

d. Synergistic Activities.

I have reviewed papers for peer-reviewed journals, books, and conferences including *Human Factors*, *The Information Society*, *International Journal of Human-Computer Interaction*, *The Handbook of Computer Networks*, *International Conference on Information Systems*, and *Americas Conference on Information Systems*.

As a doctoral student, I co-organized the Working Boundaries Graduate Conference in February 2001 in Troy, New York. I was involved in preparing the call for papers, reviewing submissions, coordinating logistics, and (informally) publishing a proceedings for distribution to conference attendees.

I am currently heavily involved in developing the curriculum for a new undergraduate minor in Informatics to be offered by the College of Information Studies of the University of Maryland. This minor takes an innovative approach by relating insights from the interdisciplinary information field to a variety of subject areas. The minor emphasizes the ethical, social, cultural, & political dimensions of information.

I teach in the areas of information ethics, social informatics, and human-computer interaction. I have taught Societal Implications of the Information Age and Interface Design at Florida State University and Information Ethics and Analysis of Interactive Systems at Drexel University. I have already created a new course at the University of Maryland on Information Ethics which has been approved to be taught in the fall of 2007 and I will also be heavily involved in teaching in the new undergraduate minor.

I have worked on numerous collaborative research projects, including collaborations on values and ethics of information technology that have led to two funded NSF grants and a total of four published or accepted peer-reviewed journal articles (including two in *Communications of the ACM*) as well as a published book chapter and numerous conference presentations, posters, and proceedings papers and a computational analysis of the Enron e-mail corpus which has led to a conference presentation.

e. Collaborators & Other Affiliations

(i) Collaborators: Jeffrey Baumes (Rensselaer Polytechinic Institute), Andrew Crapo (General Electric), Vedat Diker (University of Maryland), Shawna N. Ganaway (Verizon Corporation), Mark Goldberg (Rensselaer Polytechnic Institute), Paul Jaeger (University of Maryland), Kari Kelton (Aptima, Inc.), Malik Magdon-Ismail (Rensselaer Polytechnic Institute), Douglas W. Oard (University of Maryland), Yan Qu (University of Maryland), Russell W. Robbins (Marist College), Jennifer J. Preece (University of Maryland), Ben Shneiderman (University of Maryland), Laurie B. Waisel (Concurrent Technologies Corporation), William A. Wallace (Rensselaer Polytechnic Institute), Ping Wang (University of Maryland), Thomas R. Willemain (Rensselaer Polytechnic Institute), Fei Philip Wu (University of Maryland), Yingjie Zhou (Rensselaer Polytechnic Institute).

(ii) Graduate and Postdoctoral Advisors: David J. Hess (Rensselaer Polytechnic Institute)

William A Wallace – Biographical Sketch

Professional Preparation
1965   Ph.D. Management Science, Rensselaer Polytechnic Institute, Troy, New York.
1961   M.S. Management Science, Rensselaer Polytechnic Institute, Troy, New York.
1956   B.Ch.E. Illinois Institute of Technology, Chicago, Illinois.

Appointments
2001-Date Professor, Department of Cognitive Science, School of Humanities and Social Sciences
2000-Date Professor, Civil and Environmental Engineering Department
Spring 2000 Consultant, Board on Infrastructure and the Constructed Environment, National Research Council; Expert, Civil and Mechanical Systems Division, National Science Foundation
Fall 1999 Visiting Professor, Delft University of Technology, Netherlands
1991-1992 Visiting Professor, Polyproject: Risk and Safety of Technical Systems, Swiss Federal Institute of Technology, Zurich, Switzerland
1989 Faculty Fellow, Rockefeller Institute of Government, State University of New York, Albany, NY
1987-Date Professor, Decision Sciences and Engineering Systems Department, School of Engineering
1987-1988 Acting Chairman, Decision Sciences and Engineering Systems Department
1982-1983 U.S. Faculty Member, Management Information Systems/Decision Support Systems, National Center for Industrial Science and Technology Management Development, Dalian Institute of Technology, Dalian, Peoples Republic of China
1979   Research Fellow, International Institute of Environment and Society, Science Center, West Berlin, Germany
1974-1975 Visiting Professor of Engineering and Public Affairs, School of Urban and Public Affairs, Carnegie Mellon University, Pittsburgh, Pennsylvania
1974-1976 1971-1987 Chairman, Statistical, Management, and Information Sciences Department
1973 Visiting Professor, Graduate School of Public Affairs, State University of New York, Albany, NY
1968-1971 Director, Urban Environmental Studies
1965-1987 Member of Faculty, Rensselaer Polytechnic Institute, Troy, New York, School of Management
1956-1957 Research Engineer, Illinois Institute of Technology Research Institute, Chicago, Illinois

Relevant Publications
Robbins, R.W., and Wallace, W.A. "Decision Support for Ethical Problem Solving: A Multi-agent Approach." Decision Support Systems. In Press.

Mendonça, D., Beroggi, G.E.G., van Gent, D., and Wallace, W.A. "Designing Gaming Simulations for the Assessment of Group Decision Support Systems in Emergency Response." Safety Science, Vol. 44, No. 6 (July 2006), pp. 523-535.

Baumes, J., Goldberg, M., Chen, H.C., Magdon-Ismail, M. and Wallace, W.A, "Using Agent-Based Modeling to Traverse Frameworks in Theories of the Social", Proceedings of the International Conference on Complex Systems, June 25-30, 2006, Boston, MA. , <necsi.org/events/iccs6/viewpAPER.PHP?ID=394>

Wallace, W.A. and Fleischmann, K.R. "Models and Modeling." In Encyclopedia of Science, Technology, and Ethics, (Edited by C. Mitcham), Detroit: Macmillan Reference. 2005.

Wallace, W.A., (Editor), Ethics in Modeling, Oxford, G.B: Pergamon Press, 1994.

Other Publications
Kelton, K., Fleischmann, K.R., and Wallace, W.A. "Trust in Digital Information." Journal of the American Society for Information Science and Technology. In Press.

Mendonça, D. and Wallace, W.A. "Impacts of the 2001 World Trade Center Attack on New York City Critical Infrastructures." Journal of Infrastructure Systems, Vol. 12, No. 4 (December 2006), pp. 260-270.

Baumes, J., Goldberg, M., Hayvonovych, M., Magdon-Ismail, M., Zaki, M. and Wallace, W.A., "Finding Hidden Group Structure in a Stream of Communications", <u>Proceedings of the 4th Symposium on Intelligence and Security Informatics (ISI06)</u>, San Diego, CA, May 23-24, 2006 (Best Paper Award-Honorable Mention – awarded to top 3 papers), Vol. 3975 of Lecture Notes in Computer Science, pgs. 201-212, Springer 2006.

Baumes, J., Goldberg, M., Magdon-Ismail, M. and Wallace, W.A., "Discovering Hidden Groups in Communication Networks Using Hidden Markov Models", <u>Proceedings of the NSF/NIJ Symposium on Intelligence and Security Informatics</u>, June 2004.

Chopra, K. and Wallace, W.A., "Modeling Relationships Among Multiple Graphical Structures", <u>Computational and Mathematical Organization Theory</u>, Vol. 6, No. 4 (December 2000), pp. 361-380.

Synergistic Activities

Sloan Foundation Conference on "Ethics in Modeling" resulted in edited proceedings, 1994.

National Science Foundation sponsored Interactive Distance Video Workshop on Ethics in Modeling, 1996, with video report at distributed professional meetings.

Research on disaster management has been reported in various media including USA Today, Associated Press, Christian Science Monitor and BusinessWeek, including the National Science Foundation press briefing on Quick Response Research following World Trade Center Attack, 2004.

Member, National Research Council Committee on Social Science Research on Disasters.

2004 INFORMS President's Award for work that advances the welfare of society.

Collaborators and Co-editors

University at Buffalo – M. Bruneau, G. Lee, A. Reinhorn
University of California Berkeley – S. Chang, R. Eguchi, M. Shinozuka
University of Colorado – K. Tierney
Cornell University – T. O'Rourke
University of Southern California – D. von Winterfelt, R. Little
University at Albany – T. Birkland
Rensselaer Polytechnic Institute – D. Berg, J. Chow, M. Goldberg, P. Horn, M. Magdon-Ismail, J. Mitchell, D. Siebecker, J.M. Tien, and T. Willemain
Concurrent Technologies, Inc. – L.B. Waisel
University of Maryland - K. Fleischmann
General Electric Global Research – A. Crapo
New Jersey Institute of Technology – D. Mendonca
Aptima – K. Kelton
Marist College – R. Robbins
RAND – J. Riposo

Graduate and Postdoctoral Advisors: R. L. Carter, Rensselaer Polytechnic Institute (deceased).

Thesis Advisor:
Mark Arunasalam, NYS Workers Compensation Board, Albany, NY; Kari (Kelton) Chopra, Optima, Inc., Washington, DC; Andrew Crapo, General Electric Global Research, Schenectady, NY; David Mendonca, NJ Institute of Technology, Newark, NY; Laurie Waisel, Concurrent Technologies, Pittsburgh, PA; Bobbie-Jo M. Webb-Robertson, Pacific Northwest National Labs, Portland, OR., R. Robbins, Marist College, Poughkeepsie, NY.

Biographical Sketch for Russell W. Robbins

a. Professional Preparation

University of Missouri-Columbia	Finance	B.S.B.A.	1990
Binghamton University	Accounting	M.S.	1997
Rensselear Polytechnic Institute	Information Technology	M.S.	2004
Rensselaer Polytechnic Institute	Engineering Science	Ph.D.	2005

b. Appointments

Marist College, School of Computer Science and Mathematics, Poughkeepsie, New York:

Assistant Professor, Information Systems	2005-Date

Rensselaer Polytechnic Institute, Lally School of Management and Technology, Troy, New York:

Courtesy appointment to Faculty of Information Technology	2003-2005
Clinical Assistant Professor, Management Information Systems	2001-2005
Adjunct Instructor, Management Information Systems	1999-2000
Systems Analyst	1997-2000
Achaean Technology, Inc	1998-2000

Co-founder and President

c. Publications

(i) related publications

Robbins, R.W., and Wallace, W.A. "Decision Support for Ethical Problem Solving: A Multi-agent Approach." *Decision Support Systems*. In Press.

Robbins, R.W. (2005). Understanding Individual and Group Ethical Problem Solving: A Computational Ethics Approach. Doctoral dissertation. Rensselaer Polytechnic Institute.

Robbins, R. W., Wallace, W. A., and Puka, B. (April 2004). "Supporting Ethical Problem Solving: An Exploratory Investigation." Proceedings of the Association for Computing Machinery, Special Interest Group for Management Information Systems and Computer Personnel Research. Tucson, AZ.

Robbins, R. W., Wallace, W. A., and Puka, B. (April 2003). "Supporting the Ethical Problem Solving Process with Information Technology." Extended Abstract, Promoting Ethics in Operations Research workshop, hosted by the EURO WORKING GROUP PROMETHEUS on Ethics in OR, Fontainebleau, France.

Robbins, R. W., and Wallace, W. A. (April 2003). "Modeling the Social Dynamics of Individual Ethical Behavior." Extended Abstract, Promoting Ethics in Operations Research workshop, hosted by the EURO WORKING GROUP PROMETHEUS on Ethics in OR, Fontainebleau, France.

0734899

d. Synergistic Activities

Ethical assistant: The objective of this research was to investigate the use of decision aid technologies to support ethical problem solving. The decision aid was web-based and provided content that summarized and simplified much of moral philosophy. The question was "Could this system help students work through and solve a case that presented ethical issues?" Results showed that web-based decision aids can be built and used, and can improve the solutions developed by student participants solving cases in a laboratory environment. This work led to developing a proposal that supported my becoming one of four finalists in the 2004 Excellence in Ethics: Dissertation Proposal competition at the Institute for Ethical Business Worldwide in the Mendoza College of Business at the University of Notre Dame.

Ethical agents: The objective of this research was to determine whether a group of individuals solving an ethical problem could be modeled using software. The answer is yes. This work shows my knowledge of ethics, tendency to integrate research when appropriate, and ability to create computational models of ethics and values. In this work, I integrated the results of theorizing in several disparate disciplines: moral philosophy, moral psychology, business ethics, group dynamics, values, personality traits and communication tendencies, operations research, cognitive science and artificial intelligence.

Collaboration with students: During my ethical assistant and ethical agent studies, I have been fortunate enough to work with young people interested in becoming future researchers. In conducting this research, I have collaborated with a doctoral student, two master's students, and fourteen undergraduate students— who have assisted with the data entry, coding, and transcript analyses for these studies. I have greatly enjoyed working with these students, since their work on these projects directly contributes to their development as future (or potential) researchers, and these experiences have developed my abilities to manage a research team and participate in collaborative research projects.

Field project teaching: Currently and within the past year, I have been engaged with seven software engineering (undergraduate and graduate) courses with multiple projects. Prior to this, I taught undergraduate students in programming-based field projects for five years. Clients have included IBM, GE, Philips, NXP, and MapInfo. Sample course projects are the design and/or development of a decision support system/knowledgebase to help management troubleshoot fabrication plant tools and analyze root causes, a software review system, a problem tracking system, and an educational certification system. Other projects developed by student teams have included a projects binder, a proposal development aide, and a site locator, a registration system, a calendar, and a training evaluation system. Finally, a student team has also designed and developed a wireless remote control device enabling interaction with an interactive teddy bear for children with limited motor skills, (e.g., cerebral palsy). These students formed an entrepreneurial venture and joined the Rensselaer Incubator Center.

Community-focused action and knowledge transfer between industry and academia: This history is important because it further demonstrates my ability to develop software, my interest in software that supports humanistic interests, and my general interest in helping others. While I was at Rensselaer, I co-founded and led a company focused upon designing, developing, and marketing the first enterprise-wide information system for pseudo-government agencies providing care to individuals with developmental disabilities; developed the first data warehouse for Rensselaer; moved all academic information from a legacy information system to a modern enterprise system for Rensselaer; served on the board of a local non-profit organization for three years; and built a proof-of-concept decision support system for IT portfolio development for the CIO of the Internal Revenue Service.

e. Collaborators & Other Affiliations
(i) Collaborators: W. A. Wallace, B. Puka, K.R. Fleischmann, D. Hall
(ii) Graduate and Postdoctoral Advisors: W. A. Wallace

0734899

SUMMARY PROPOSAL BUDGET

YEAR 1

		FOR NSF USE ONLY	
ORGANIZATION		PROPOSAL NO.	DURATION (months)
University of Maryland College Park			Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR		AWARD NO.	
Kenneth R Fleischmann			

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Kenneth R Fleischmann - Assistant Professor**	**0.00**	**0.00**	**1.00**	$ **9,333**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**1.00**	**9,333**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**1**) GRADUATE STUDENTS				**12,822**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**22,155**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**4,593**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**26,748**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**1,530**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ 0					
2. TRAVEL 0					
3. SUBSISTENCE 0					
4. OTHER 0					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**3,500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**750**	
TOTAL OTHER DIRECT COSTS				**4,250**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**32,528**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC (Rate: 48.5000, Base: 31778)					
TOTAL INDIRECT COSTS (F&A)				**15,412**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**47,940**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **47,940**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY
Kenneth R Fleischmann	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME*	Date Checked / Date Of Rate Sheet / Initials - ORG
Monique Anderson	

1 **ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

0734894

				FOR NSF USE ONLY	
ORGANIZATION				PROPOSAL NO.	DURATION (months)
University of Maryland College Park					Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.	
Kenneth R Fleischmann					

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Kenneth R Fleischmann - Assistant Professor**	**0.00**	**0.00**	**1.00**	$ **9,800**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**1.00**	**9,800**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**1**) GRADUATE STUDENTS				**13,463**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**23,263**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**4,823**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**28,086**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**1,531**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**3,500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**787**	
TOTAL OTHER DIRECT COSTS				**4,287**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**33,904**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC (Rate: 48.5000, Base: 33117)					
TOTAL INDIRECT COSTS (F&A)				**16,062**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**49,966**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **49,966**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Kenneth R Fleischmann	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Monique Anderson			

2 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

0734894

SUMMARY
PROPOSAL BUDGET

YEAR 3

	FOR NSF USE ONLY	
ORGANIZATION	PROPOSAL NO.	DURATION (months)
University of Maryland College Park		Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR	AWARD NO.	
Kenneth R Fleischmann		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Kenneth R Fleischmann - Assistant Professor**	**0.00**	**0.00**	**1.00**	$ **10,290**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**1.00**	**10,290**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**1**) GRADUATE STUDENTS				**14,136**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**24,426**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**5,064**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**29,490**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**1,533**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ 0					
2. TRAVEL 0					
3. SUBSISTENCE 0					
4. OTHER 0					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**3,500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**827**	
TOTAL OTHER DIRECT COSTS				**4,327**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**35,350**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC (Rate: 48.5000, Base: 34523)					
TOTAL INDIRECT COSTS (F&A)				**16,744**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**52,094**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **52,094**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Kenneth R Fleischmann	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Monique Anderson			

3 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

0734894

SUMMARY
PROPOSAL BUDGET

Cumulative

ORGANIZATION **University of Maryland College Park**				PROPOSAL NO.	DURATION (months)
					Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Kenneth R Fleischmann**				AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Kenneth R Fleischmann - Assistant Professor**	**0.00**	**0.00**	**3.00**	$ **29,423**	$
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**3.00**	**29,423**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**3**) GRADUATE STUDENTS				**40,421**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**69,844**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**14,480**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**84,324**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**4,594**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**10,500**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**2,364**	
TOTAL OTHER DIRECT COSTS				**12,864**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**101,782**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**48,218**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**150,000**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **150,000**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **Kenneth R Fleischmann**	FOR NSF USE ONLY
	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME* **Monique Anderson**	Date Checked | Date Of Rate Sheet | Initials - ORG

C *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

0734894

Budget Justification
University of Maryland

Senior Personnel
For the PI, Kenneth R. Fleischmann, the budget includes 1 month of summer salary per year.

Other Personnel
The budget includes three years of half-time, year-round stipend support one doctoral student. The doctoral student will be enrolled in the doctoral program of the College of Information Studies.

Fringe Benefits
Following the requirements of the University of Maryland, the budget includes fringe benefits for all salary and stipend amounts, including 30% of the cost of student stipends and 8% of all faculty summer salary.

Travel
This grant provides funding for the PI to travel to one academic conference per year.

Consultant Services
Davina Pruitt-Mentle will serve as the external evaluator for this study. She will evaluate and oversee the data collection and analysis for the study, as well as the development of the simulation and the course. She will also be responsible for the project evaluation planning, operations, deliverables, and will provide reporting of a formative and summative nature for feedback to the PIs, the advisory board, and the NSF.

Davina Pruitt-Mentle has been sub-contracted for $3500 per year (contract renewable each year) for three years. This amount is based on Davina Pruitt-Mentle allocating 10 days per year as described in Tables 1, 2, and 3, which describe the activities and outputs of the external evaluator for years 1, 2, and 3, respectively. A billable rate of $350 per day is used in this calculation.

	Advisory Board Meeting	**Course Design and Instruction**	**Alpha Version of SIMULATE**	**Annual Report**
External Evaluator's Activities	Prepare for Advisory Board Meeting and Attend Advisory Board Meeting	Evaluate the Course Syllabus, Observe a Class Session, and Evaluate Learning Outcomes of Students	Evaluate the Data Collection Instruments, Observe Use of SIMULATE, and Evaluate Data Analysis	Create an Annual Report Summarizing Activities and Outputs for the Year
External Evaluator's Outputs	Presentation at Advisory Board Meeting and Feedback about Meeting	Preliminary Report Summarizing Evaluation of the Course Design and Instruction	Preliminary Report Summarizing Evaluation of Alpha Version of SIMULATE	Annual Report to Be Submitted to the PIs, the Advisory Board, and the NSF
Days Allocated	2	3	3	2

Table 1: How the $3500 Consulting Fee for the External Evaluator Is Spent in Year 1

0734894

	Advisory Board Meeting	**Beta Version of SIMULATE**	**Final Version of SIMULATE**	**Annual Report**
External Evaluator's Activities	Prepare for Advisory Board Meeting and Attend Advisory Board Meeting	Evaluate the Data Collection Instruments, Observe Use of SIMULATE, and Evaluate Data Analysis	Evaluate the Data Collection Instruments, Observe Use of SIMULATE, and Evaluate Data Analysis	Create an Annual Report Summarizing Activities and Outputs for the Year
External Evaluator's Outputs	Presentation at Advisory Board Meeting and Feedback about Meeting	Preliminary Report Summarizing Evaluation of Beta Version of SIMULATE	Preliminary Report Summarizing Evaluation of Final Version of SIMULATE	Annual Report to Be Submitted to the PIs, the Advisory Board, and the NSF
Days Allocated	2	3	3	2

Table 2: How the $3500 Consulting Fee for the External Evaluator Is Spent in Year 2

	Advisory Board Meeting	**Disseminate in C3 Courses**	**Disseminate Beyond C3**	**Annual Report**
External Evaluator's Activities	Prepare for Advisory Board Meeting and Attend Advisory Board Meeting	Implement SIMULATE and other course materials in C3 Courses	Encourage Dissemination of SIMULATE and other materials beyond C3	Create Final Report of Activities and Outputs for the Entire Study
External Evaluator's Outputs	Presentation at Advisory Board Meeting and Feedback about Meeting	Report Evaluating Success of SIMULATE in C3 Courses	Report Summarizing Success of Dissemination Efforts	Annual Report to Be Submitted to the PIs, the Advisory Board, and the NSF
Days Allocated	2	4	2	2

Table 3: How the $3500 Consulting Fee for the External Evaluator Is Spent in Year 3

Other
Following the requirements of the University of Maryland, the budget includes tuition for the student supported by this proposal. The tuition amount is one-half of the flat tuition charge.

Indirect Costs
Following the requirements of the University of Maryland, the budget includes indirect costs at the federally negotiated on-campus rate of 48.5% of all direct costs, excluding tuition.

SUMMARY PROPOSAL BUDGET

YEAR 1

ORGANIZATION **Rensselaer Polytechnic Institute**						**FOR NSF USE ONLY**	
						PROPOSAL NO.	DURATION (months)
							Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **William A Wallace**						AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **William A Wallace - Principal Investigator**	0.00	0.00	0.00	$ 0	$
2.					
3.					
4.					
5.					
6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	0	
7. (1) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	0	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (0) POST DOCTORAL ASSOCIATES	0.00	0.00	0.00	0	
2. (0) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	0	
3. (1) GRADUATE STUDENTS				4,908	
4. (0) UNDERGRADUATE STUDENTS				0	
5. (0) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				0	
6. (0) OTHER				0	
TOTAL SALARIES AND WAGES (A + B)				4,908	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				0	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				4,908	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				0	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				5,000	
2. FOREIGN				2,000	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ 0					
2. TRAVEL 0					
3. SUBSISTENCE 0					
4. OTHER 0					
TOTAL NUMBER OF PARTICIPANTS (0) TOTAL PARTICIPANT COSTS				0	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				0	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				0	
3. CONSULTANT SERVICES				0	
4. COMPUTER SERVICES				0	
5. SUBAWARDS				0	
6. OTHER				0	
TOTAL OTHER DIRECT COSTS				0	
H. TOTAL DIRECT COSTS (A THROUGH G)				11,908	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **MTDC (Rate: 26.0000, Base: 11908)**					
TOTAL INDIRECT COSTS (F&A)				3,096	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				15,004	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				0	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 15,004	$
M. COST SHARING PROPOSED LEVEL $ 0 AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **William A Wallace**	**FOR NSF USE ONLY**		
	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Jennifer Newnham			

1 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

0734879

SUMMARY
PROPOSAL BUDGET

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
		Proposed Granted
	AWARD NO.	

ORGANIZATION **Rensselaer Polytechnic Institute**					

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR
William A Wallace

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **William A Wallace - Principal Investigator**	0.00	0.00	0.00	$ 0	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	0	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	0	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	0.00	0.00	0.00	0	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	0	
3. (**1**) GRADUATE STUDENTS				5,105	
4. (**0**) UNDERGRADUATE STUDENTS				0	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				0	
6. (**0**) OTHER				0	
TOTAL SALARIES AND WAGES (A + B)				5,105	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				0	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				5,105	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				0	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				10,647	
2. FOREIGN				2,000	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ 0					
2. TRAVEL 0					
3. SUBSISTENCE 0					
4. OTHER 0					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				0	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				0	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				0	
3. CONSULTANT SERVICES				0	
4. COMPUTER SERVICES				0	
5. SUBAWARDS				0	
6. OTHER				0	
TOTAL OTHER DIRECT COSTS				0	
H. TOTAL DIRECT COSTS (A THROUGH G)				17,752	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **MTDC (Rate: 26.0000, Base: 17752)**					
TOTAL INDIRECT COSTS (F&A)				4,616	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				22,368	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				0	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 22,368	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **William A Wallace**	FOR NSF USE ONLY
	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME* **Jennifer Newnham**	Date Checked Date Of Rate Sheet Initials - ORG

2 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

0734879

SUMMARY
PROPOSAL BUDGET   YEAR   3

ORGANIZATION				FOR NSF USE ONLY		
Rensselaer Polytechnic Institute				PROPOSAL NO.	DURATION (months)	
					Proposed	Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.		
William A Wallace						

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **William A Wallace - Principal Investigator**	**0.00**	**0.00**	**0.00**	$ **0**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**0.00**	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**1**) GRADUATE STUDENTS				**5,310**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**5,310**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**5,310**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**10,650**	
2. FOREIGN				**2,000**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **0**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**17,960**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC (Rate: 26.0000, Base: 17959)					
TOTAL INDIRECT COSTS (F&A)				**4,669**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**22,629**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **22,629**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
William A Wallace	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Jennifer Newnham			

3 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

0734879

SUMMARY
PROPOSAL BUDGET

Cumulative

ORGANIZATION				**FOR NSF USE ONLY**		
Rensselaer Polytechnic Institute				PROPOSAL NO.	DURATION (months)	
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR					Proposed	Granted
William A Wallace				AWARD NO.		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **William A Wallace - Principal Investigator**	**0.00**	**0.00**	**0.00**	$ **0**	$
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**0.00**	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**3**) GRADUATE STUDENTS				**15,323**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**15,323**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**15,323**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**26,297**	
2. FOREIGN				**6,000**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $_____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**47,620**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**12,381**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**60,001**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **60,001**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	**FOR NSF USE ONLY**		
William A Wallace	**INDIRECT COST RATE VERIFICATION**		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Jennifer Newnham			

C ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

0734879

Rensselaer Polytechnic Institute Budget Justification

Other Personnel: $15,323

* 1 Doctoral Student

This project will include summer support and training for one doctoral student. During a three-year period, the doctoral student will be participate in research activities and will receive significant training.

Travel: $31,530

- Domestic Travel ($26,297)

This grant provides funding for the PI to present the findings of the research as papers and workshops at two domestic conferences per year ($1500 x 2 = $3000 per year), to attend the advisory board meeting each year and also to reimburse the two distant advisory board members for their travel costs as part of the role of liaison between the research team and the advisory board ($2000 per year), to travel to eight other institutions of higher education in year 2 to encourage faculty at these institutions to use the SIMULATE software and accompanying course materials in their graduate ethics courses and thus broaden the audience for and impact of SIMULATE and the course ($5647), and travel again to the same eight institutions in year 3 to give guest lectures and observe use of SIMULATE and other course materials in graduate courses at other institutions.

- International Travel ($6,000)

This grant provides funding for the PI to present the findings of the research as papers and workshops at one international conference per year ($2000 per year)

Indirect Costs: $12,381

Since the majority of the requested funding is to be spent off-campus (in the form of travel funding), this proposal qualifies for the off-campus indirect cost rate of 26%.

SUMMARY PROPOSAL BUDGET   YEAR 1

				FOR NSF USE ONLY	
ORGANIZATION				PROPOSAL NO.	DURATION (months)
Marist College					Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.	
Russell W Robbins					

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Russell W Robbins - Assistant Professor**	**0.00**	**0.00**	**2.00**	$ **18,229**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**2.00**	**18,229**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**2**) UNDERGRADUATE STUDENTS				**5,040**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**23,269**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**5,654**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**28,923**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**2,083**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**2,400**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**2,400**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**33,406**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
Salary and Wage Base (Rate: 56.0000, Base: 23269)					
TOTAL INDIRECT COSTS (F&A)				**13,031**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**46,437**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **46,437**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Russell W Robbins	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
John Ritschdorff			

1 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

0734899

SUMMARY
PROPOSAL BUDGET

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
ORGANIZATION **Marist College**		Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Russell W Robbins**	AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Russell W Robbins - Assistant Professor**	**0.00**	**0.00**	**1.00**	$ **9,239**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**1.00**	**9,239**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**2**) UNDERGRADUATE STUDENTS				**2,700**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**11,939**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**2,869**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**14,808**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**2,083**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**16,891**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **Salary and Wage Base (Rate: 56.0000, Base: 11939)**					
TOTAL INDIRECT COSTS (F&A)				**6,686**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**23,577**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **23,577**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY
Russell W Robbins	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME*	Date Checked / Date Of Rate Sheet / Initials - ORG
John Ritschdorff	

2 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

0734899

SUMMARY PROPOSAL BUDGET

YEAR 3

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
ORGANIZATION **Marist College**		Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Russell W Robbins**	AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Russell W Robbins - Assistant Professor**	**0.00**	**0.00**	**1.00**	$ **9,609**	$
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	**0.00**	**0.00**	**0.00**	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	**0.00**	**0.00**	**1.00**	**9,609**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	**0.00**	**0.00**	**0.00**	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	**0.00**	**0.00**	**0.00**	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**9,609**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**2,912**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**12,521**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**2,083**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ 0					
2. TRAVEL 0					
3. SUBSISTENCE 0					
4. OTHER 0					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**14,604**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **Salary and Wage Base (Rate: 56.0000, Base: 9609)**					
TOTAL INDIRECT COSTS (F&A)				**5,381**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**19,985**	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ **19,985**	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Russell W Robbins	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
John Ritschdorff			

3 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

0734899

SUMMARY
PROPOSAL BUDGET

Cumulative

					FOR NSF USE ONLY	
ORGANIZATION **Marist College**					PROPOSAL NO.	DURATION (months)
						Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Russell W Robbins**					AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Russell W Robbins - Assistant Professor**	0.00	0.00	4.00	$ 37,077	$
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	0	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	4.00	37,077	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL ASSOCIATES	0.00	0.00	0.00	0	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	0	
3. (**0**) GRADUATE STUDENTS				0	
4. (**4**) UNDERGRADUATE STUDENTS				7,740	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				0	
6. (**0**) OTHER				0	
TOTAL SALARIES AND WAGES (A + B)				44,817	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				11,435	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				56,252	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				0	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				6,249	
2. FOREIGN				0	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ 0					
2. TRAVEL 0					
3. SUBSISTENCE 0					
4. OTHER 0					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				0	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				2,400	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				0	
3. CONSULTANT SERVICES				0	
4. COMPUTER SERVICES				0	
5. SUBAWARDS				0	
6. OTHER				0	
TOTAL OTHER DIRECT COSTS				2,400	
H. TOTAL DIRECT COSTS (A THROUGH G)				64,901	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				25,098	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				89,999	
K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.)				0	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 89,999	$
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Russell W Robbins	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
John Ritschdorff			

C ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

0734899

Marist College Budget Justification

Senior Personnel: $37,077

For the PI leading the software development effort, Russell W. Robbins, the budget includes 2 summer months in 2008, and one month in 2009 as well as 2010. The PI will design, develop, and validate and verify SIMULATE, incrementally and iteratively. Assessment will include functional, performance, unit, integration and systems testing. The PI will manage undergraduate students learning these software engineering techniques.

Other Personnel: $7,740

The budget includes funds to employ 2 Marist College undergraduate students at $9 per hour, for a total 430 hours, in years 1 and 2. The undergraduate students will assist the PI with design, development, validation, and verification of SIMULATE.

Fringe Benefits: $11,435

Fringe Benefits are calculated at 30.3% for faculty and 2.6% for students.

Travel: $6,249

This grant provides funding for the PI to travel to the University of Maryland primarily, and Rensselaer Polytechnic Institute secondarily, to attend advisory group meetings, collect data, and test software. It also supports two trips to conferences and one trip to another institution to provide a guest lecture.

Materials and Supplies: $2,400

This grant funds the purchase of computers to support software development.

Indirect Costs: $25,098

Marist College's federally negotiated on-campus indirect cost rate is 56% of salaries and wages.

0734899

Current and Pending Support
(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Kenneth Fleischmann**

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Collaborative Research: An Exploratory Study of the Ethical Implications of Embedding Values in Computational Models**

Source of Support: **NSF: Ethics and Values of Science, Engineering, & Technology**
Total Award Amount: $ **60,517** Total Award Period Covered: **09/01/05 - 08/31/07**
Location of Project: **University of Maryland**
Person-Months Per Year Committed to the Project. Cal:**0.00** Acad: **0.00** Sumr: **2.00**

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **SGER: Past Futures and Technoscientific Innovation: Science Fiction in the Lives of Scientists and Engineers**

Source of Support: **NSF: Social Studies of Science, Engineering, & Technology**
Total Award Amount: $ **15,000** Total Award Period Covered: **08/15/06 - 07/31/07**
Location of Project: **University of Maryland**
Person-Months Per Year Committed to the Project. Cal:**0.00** Acad: **0.00** Sumr: **0.00**

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Collaborative Research: Ethical Implications of Values in Computational Modeling**

Source of Support: **NSF: Ethics and Values of Science, Engineering, & Technology**
Total Award Amount: $ **106,667** Total Award Period Covered: **03/01/07 - 02/28/09**
Location of Project: **University of Maryland**
Person-Months Per Year Committed to the Project. Cal:**0.00** Acad: **0.00** Sumr: **2.00**

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **HCC: Digital Libraries and Human Values: Human-Computer Interaction Meets Social Informatics**

Source of Support: **NSF: Human-Centered Computing**
Total Award Amount: $ **450,000** Total Award Period Covered: **08/01/07 - 07/31/10**
Location of Project: **University of Maryland**
Person-Months Per Year Committed to the Project. Cal:**0.00** Acad: **0.00** Sumr: **2.00**

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **DHB: Scalable Computational Analysis of the Diffusion of Technological Concepts**

Source of Support: **NSF: Human and Social Dynamics: Dynamics of Human Behavior**
Total Award Amount: $ **750,000** Total Award Period Covered: **08/01/07 - 07/31/10**
Location of Project: **University of Maryland**
Person-Months Per Year Committed to the Project. Cal:**0.00** Acad: **0.00** Summ: **1.00**

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

USE ADDITIONAL SHEETS AS NECESSARY

0734894

Current and Pending Support
(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

	Other agencies (including NSF) to which this proposal has been/will be submitted.
Investigator: **Kenneth Fleischmann**	

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: **Collaborative Research: Educational Simulation for Computing and Information Ethics**

Source of Support: **NSF: Ethics Education in Science and Engineering**
Total Award Amount: $ **150,000** Total Award Period Covered: **01/01/08 - 12/31/10**
Location of Project: **University of Maryland**
Person-Months Per Year Committed to the Project.   Cal:**0.00**   Acad: **0.00**   Sumr: **1.00**

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

0734894

Current and Pending Support for: Wallace, William Alan

Code	Record Indicator	Sponsor 4 Name	Title	Begin Calendar Date	End Calendar Date	Support Type	Total Funding To-Date	Current Funding Amount	Charge Out Rate
J40002	Award	Cornell University	Ado Traveler Info Systems (ATIS) Implementation and Integration	06/01/02	04/30/07		3,725,879	785,159	
J11767	Award	National Science Foundation	Collaborative Research (DRU): Shared Goverenance of Risks	10/01/06	09/30/09		299,578	299,578	
J11744	Award	National Science Foundation	SGER: Algorithms and Software Tools for Discovering Coalitions and Identifying Leaders in the Blogosphere	08/01/06	07/31/07		193,000	193,000	
J11707	Award	Office of Naval Research	Uncovering the Hidden Networks that Support IED Activity	03/15/06	05/03/09		512,877	230,772	
J11707	Award Charge Out	Office of Naval Research		06/01/07	08/31/07	Summer			33.0%
J11695	Award	National Science Foundation	Social Communication Networks for Early Warning in Disasters	04/01/06	03/31/07		70,789	70,789	
J11662	Award	National Science Foundation	Collaborative Research: Organizational Design Issues in Emergency Management	12/01/05	11/30/08		43,855	4,250	
J11648	Award	National Science Foundation	Collaborative Research: An Exploratory Study of the Ethical Implications of Embedding Values in Computational Models	09/01/05	08/31/07		29,483	29,483	

0734879

Current and Pending Support for: Wallace, William Alan

Code	Record Indicator	Sponsor 4 Name	Title	Begin Calendar Date	End Calendar Date	Support Type	Total Funding To-Date	Current Funding Amount	Charge Out Rate
J11648	Award Charge Out	National Science Foundation		06/01/06	08/31/06	Summer			17.0%
J11604	Award	National Science Foundation	SGER: Using Global Communication Systems as Early Warning Systems for Natural Disasters	06/01/05	05/31/07		95,308	95,308	
J11432	Award	National Science Foundation	ITR: Study of Dynamically Evolving Social Groups in Communication Networks	09/15/03	08/31/07		693,400	100,000	
J11432	Award Charge Out	National Science Foundation		06/01/07	08/31/07	Summer			8.0%
61205260A	Proposal	National Science Foundation	ITR:Study of Dynamically Evolving Social Groups in Communication Networks	06/01/05	05/31/06		143,400	143,400	
61205260A	Proposal Charge Out	National Science Foundation		06/01/05	08/31/05	Summer			17.0%

0734879

Current and Pending Support for: Wallace, William Alan

Code	Record Indicator	Sponsor 4 Name	Title	Begin Calendar Date	End Calendar Date	Support Type	Total Funding To-Date	Current Funding Amount	Charge Out Rate
2035	Proposal	National Science Foundation	Design, Vulnerability and Restoration of Interdependent Civil and Cyber-Infrastructure Systems	08/15/07	08/14/10		362,909	362,909	
1953	Proposal	Research Foundation Suny Buffalo	Reliable State-of-the-Art Adaptive Technologies to Advance Seismic Protection in Bridge Engineering	10/01/07			204,999	204,999	
1879	Proposal	National Science Foundation	Diffusion in Dynamic Graphs: From Infectious Ideas in Online Communities to Evacuation in Social Networks	06/01/07	05/31/10		394,792	394,792	
1599	Proposal	National Science Foundation	Collaborative Research: Ethical Implications of Values in Computational Modeling	01/01/07	12/31/08		66,666	66,666	

0734879

Current and Pending Support
(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **William Wallace**	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Collaborative Research: Educational Simulation for Computing and Information Ethics**

Source of Support: **National Science Foundatioin**
Total Award Amount: $ **60,000** Total Award Period Covered: **01/01/08 - 12/31/10**
Location of Project: **off campus**
Person-Months Per Year Committed to the Project. Cal:**0.00** Acad: **0.00** Sumr: **0.00**

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

0734879

Current and Pending Support
(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Russell Robbins**	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Collaborative Research: Educational Simulation for Computing and Information Ethics**

Source of Support: **NSF: Ethics Education in Science and Engineering**
Total Award Amount: $ **89,999** Total Award Period Covered: **01/01/08 - 12/31/10**
Location of Project: **Marist College**
Person-Months Per Year Committed to the Project. Cal:**0.00** Acad:**0.00** Sumr: **1.33**

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Summ:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

USE ADDITIONAL SHEETS AS NECESSARY

0734899

FACILITIES, EQUIPMENT & OTHER RESOURCES

FACILITIES: Identify the facilities to be used at each performance site listed and, as appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Use "Other" to describe the facilities at any other performance sites listed and at sites for field studies. USE additional pages as necessary.

Laboratory: **The PI and the doctoral student will have access to collaborative laboratory space within the new joint laboratory of the College of Information Studies and the Human-Computer Interaction Laboratory (the PI is affiliated with both units) that will open in June 2007.**

Clinical:

Animal:

Computer: **The PI has a computer provided by the College of Information Studies. The doctoral student will be able to use computers provided within the collaborative laboratory space.**

Office: **The PI has an office provided by the College of Information Studies. In the summer of 2007, the PI will move his office to within the new research collaboration floor of the Hornbake Library to be close to the collaborative laboratory space and the doctoral student's cubicle.**

Other:

MAJOR EQUIPMENT: List the most important items available for this project and, as appropriate identifying the location and pertinent capabilities of each.

OTHER RESOURCES: Provide any information describing the other resources available for the project. Identify support services such as consultant, secretarial, machine shop, and electronics shop, and the extent to which they will be available for the project. Include an explanation of any consortium/contractual arrangements with other organizations.

0734894

FACILITIES, EQUIPMENT & OTHER RESOURCES

FACILITIES: Identify the facilities to be used at each performance site listed and, as appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Use "Other" to describe the facilities at any other performance sites listed and at sites for field studies. USE additional pages as necessary.

Laboratory: **n/a**

Clinical: **n/a**

Animal: **n/a**

Computer: **n/a**

Office: **n/a**

Other: **n/a**

MAJOR EQUIPMENT: List the most important items available for this project and, as appropriate identifying the location and pertinent capabilities of each.

n/a

OTHER RESOURCES: Provide any information describing the other resources available for the project. Identify support services such as consultant, secretarial, machine shop, and electronics shop, and the extent to which they will be available for the project. Include an explanation of any consortium/contractual arrangements with other organizations.

n/a

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FACILITIES, EQUIPMENT & OTHER RESOURCES

FACILITIES: Identify the facilities to be used at each performance site listed and, as appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Use "Other" to describe the facilities at any other performance sites listed and at sites for field studies. USE additional pages as necessary.

Laboratory: N/A

Clinical: N/A

Animal: N/A

Computer: **Marist College has provided the PI with a PC.**

Office: **Marist College will provide office space as necessary.**

Other: N/A

MAJOR EQUIPMENT: List the most important items available for this project and, as appropriate identifying the location and pertinent capabilities of each.

N/A

OTHER RESOURCES: Provide any information describing the other resources available for the project. Identify support services such as consultant, secretarial, machine shop, and electronics shop, and the extent to which they will be available for the project. Include an explanation of any consortium/contractual arrangements with other organizations.

Marist College has provided the PI with clerical support.

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Department of Science, Technology, and Society (STS)
Science and Technology Policy Internship Program

April 6, 2007

Kenneth R. Fleischmann, Ph.D.
Assistant Professor
College of Information Studies
University of Maryland
College Park, MD 20740-4345

Dear Ken,

I am very pleased to accept the invitation to serve on the advisory board for your proposed NSF EESE project with Russ Robbins and Al Wallace. The study you propose looks very promising and I believe has a strong potential to make significant contributions in terms of both research and education. I am also impressed with the diverse and complementary interdisciplinary expertise of the research team. You already have a good track record of effective collaboration on similar topics.

I welcome the opportunity to play a role in shaping the development of this project. I will be happy to attend the annual advisory board meetings and to provide feedback about the study as needed. Let me know if I can do anything else as I would really like for this project to be funded.

I look forward to having the opportunity to work with the research team on this important project!

Sincerely,

Deborah Johnson

Deborah G. Johnson
Olsson Professor of Applied Ethics & Chair
Department of Science, Technology and Society
University of Virginia
P.O. Box 400744
351 McCormick Road
Charlottesville, VA 22904-4744

UNIVERSITY OF ILLINOIS
AT SPRINGFIELD

Computer Science Program
University Hall, Room 3100
One University Plaza, MS UHB 3100
Springfield, Illinois 62703-5407

To : National Science Foundation, EESE
From : Keith W. Miller, Professor of Computer Science
Date : April 6, 2007
Re : Ethics Education proposal from Fleischmann, Robbins and Wallace

I was invited to serve on the advisory board for a project proposed by Ken Fleischmann, Russ Robbins, and Al Wallace, and I am glad to do so. I think the proposed study has the potential to uncover useful research findings and to have significant applications in education. The breadth and depth of the researchers is a strong point of the proposal.

As part of the advisory board, I hope to contribute my perspective on topics I am most involved with, including computer ethics education, online teaching and learning, and artificial moral agents. In the past, I was involved with two major NSF grants during which Deborah Johnson, Tracy Camp, Laurie King, Chuck Huff, Barbara Moskal and others directed workshops and did research to improve pedagogy for teaching ethics to computer science students. I was recently named the next Editor-in-Chief of the magazine *IEEE Technology & Society*, where I hope to encourage scholarly work in this area.

As a member of the advisory board, I am committed to attending the annual advisory board meetings and to providing advice when it is requested by the research team. I look forward to working with the research team and the rest of the advisory board.

I often teach courses in which undergraduate and graduate computer science students study the interaction of technical decisions and human values. I hope to use in my own teaching the simulation and associated course materials generated by the proposed work. Because of my work in this area, I am often asked about teaching materials in computer ethics, and I occasionally give presentations on currently available resources for faculty interested in integrating ethics in their courses. The kinds of materials envisioned in this proposal are exactly the kinds of materials computer science faculty would, in my opinion, find useful.

Sincerely,

Keith W. Miller, Professor of Computer Science; Associate Editor of *IEEE Technology & Society*

Phone (217) 206-6770   UIS   Fax (217) 206-6217

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April 3, 2007

Assistant Professor Kenneth R. Fleischmann, Ph.D.
College of Information Studies
University of Maryland
College Park, MD 20742

Assistant Professor Russell W. Robbins, Ph.D.
School of Computer Science and Mathematics
Marist College
Poughkeepsie, NY 12601

Professor William A. Wallace, Ph.D.
Department of Decision Sciences and Engineering Systems
Rensselaer Polytechnic Institute
Troy, NY 12180

Dear Professors Fleischmann, Robbins, and Wallace,

I am writing to indicate my willingness to serve on the advisory board for their NSF EESE project. I am very impressed by this study, and I strongly believe that it can make important contributions in terms of both research and education. I am also quite impressed by your research team, including the interdisciplinary perspectives that your team brings to this important problem and your proven track records of conducting NSF-funded research that makes contributions to both science and society.

In serving on your advisory board, I am happy to apply my expertise in the fields of human-computer interaction, educational technology, and ethics of computing. As you know, I was the Founding Director of the Human-Computer Interaction Laboratory, an organization that has carried out many successful NSF-funded research projects. I also recently organized an NSF Workshop on Creativity Support Tools, and I am currently organizing an upcoming Conference on Creativity & Cognition.

As a member of the advisory board for your project, I will be happy to attend the annual advisory board meetings and provide any feedback that might help you to refine your study. I look forward to working with you on this project and helping to shape the development of your study. I would also be interested in helping to aid the dissemination of your simulation, including encouraging colleagues to use your simulation and your course. I wish you the best of luck with the review of your proposal and I hope that it will be funded.

Sincerely yours,

Founding Director (1983-2000), Human-Computer Interaction Lab
Professor, Computer Science
Member, Institute for Advanced Computer Studies

Ben Shneiderman, Dept of Computer Science ♦ ben@cs.umd.edu   http://www.cs.umd.edu/~ben
Univ. of Maryland ♦ College Park, Maryland 20742 ♦ 3177 A.V. Williams Building   (301) 405-2680

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UNIVERSITY OF
MARYLAND

COLLEGE OF EDUCATION
Dean's Office

2127 Tawes Building
College Park, Maryland 20742
301.405.8202 T 301.314.9890 FAX
dpruitt@umd.edu

Educational Technology Outreach

Priscilla Regan, Program Director
Directorate for Social, Behavioral and Economic Sciences, Science and Society Program
Ethics Education in Science and Engineering (EESE)
National Science Foundation
4201 Wilson Blvd.
Arlington, VA 22230

April 3, 2007

Dear Dr. Regan:

I am pleased to support the proposed "**SIMULATE**" project submission to the National Science Foundation's Ethics Education in Science and Engineering (EESE) program, principal investigators, Dr. Kenneth R. Fleischmann, Dr. Russell W. Robbins and Dr. William A. Wallace. As Director for Educational Technology Policy, Research, and Outreach within the College of Education at the University of Maryland, and Director of the Cyberethics, Cybersafety and Cybersecurity (C3) Institute, I am especially pleased to see this new effort that addresses the gap between computing and information ethics. This complements my efforts with the NSF funded ATE Regional Center CyberWATCH grant which seeks to increase the pipeline of computer security experts. Innovative and effective means of teaching computing and information ethics is one of the reoccurring requests by faculty needed for their Information Assurance curriculum.

The C3 Institute provides outreach services to the educational community about the ethical, safety, and security implications of technology use. As part of this mission, and in its dual role of providing Educational Technology Outreach for the University of Maryland, the C3 Institute is dedicated to high-quality evaluation, including program evaluation design, data collection, and reporting. Evaluation and Assessment work samples include: Teachers Use of Universal Design Before and After the Completion of a UD for ESOL Course for the Maryland Higher Education Consortium (MHEC) – evaluates the effectiveness of a two year teacher professional development and intervention program assisting educators to address the content-area language and literacy needs of Latino middle and secondary students in a large Mid-Atlantic School System; Analysis of Multicultural Approaches to Problem-Based Learning for Informal Computer Literacy Programs – compares program delivery and cultural differences toward utilization of technology; and Maryland Information Literacy, Ethical Use and Academic Integrity Baseline Data Study documents Maryland local school systems and Institutes of Higher Education instances of plagiarism and reports how the cases are reported and managed, and if and how vertical articulation between K-12 and higher education exists to ensure effective and consistent models and practices for the Preparing Maryland for the Information Literacy, Ethical Use and Academic Integrity Initiative.

As an external evaluator, I understand that evaluation is essential in bridging the gap between lofty goals and sound decisions. I have met with project PI Kenneth R. Fleischmann to sketch out the project evaluation design. This shared understanding of the scope, purpose, and setting of the project activities led to the development of the proposal logic model.

I am delighted to participate in the SIMULATE project should it be funded. Serving as an external evaluator I will provide an outside perspective on the success of the simulation and the course. I will evaluate and oversee the data collection and analysis for the study, be responsible for the project evaluation planning, operations, deliverables, and will provide reporting of a formative and summative nature for feedback to the PIs, the advisory board, and the NSF.

Sincerely,

Davina Pruitt-Mentle
Director
Educational Technology Policy, Research and Outreach
C3 Institute
College of Education
The University of Maryland

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GLENN L. MARTIN INSTITUTE OF TECHNOLOGY
A. JAMES CLARK SCHOOL OF ENGINEERING
Department of Chemical & Biomolecular Engineering

2113 Building 090
College Park, MD 20742-2111
301-405-0523 FAX

April 5, 2007

LETTER OF SUPPORT FOR FLEISCHMANN-ROBBINS-WALLACE PROPOSAL

As a recipient of a 2006 NSF EESE Award, I am writing to express my support for the EESE proposal submitted by Ken Fleischmann, Russ Robbins, and Al Wallace, titled: "Educational Simulation for Computing and Information Ethics." This is an excellent proposal that promises to make important contributions to research and education in computing and information ethics.

Our funded EESE project, "Maryland Initiative on Research Ethics," for which I, Robert J. Dooling, and Arthur N. Popper are Co-PIs, aims to develop a set of ethics courses and workshops that provide training on research integrity for graduate students, postdoctoral associates, and new assistant professors. Our study focuses on graduate education for research-oriented programs in the life and physical sciences and engineering, while the proposed new study focuses on professional graduate programs in computer science and the information field. However, there is similarity in the philosophical approaches and spirits of these two projects which can be complementary and mutually beneficial.

My colleagues and I hope that this new EESE proposal will also be funded, because we are very interested in following the development of the simulation and the course that will be created. Specifically, we would be interested in the possibility of working with the PI's of this study to incorporate their simulation into our research ethics courses for scientists and engineers, through modification of the software to include science and engineering ethics cases in addition to their computing and information ethics cases. We would also be able to use insights developed through the development of the new project's courses in our own courses, and we would be happy to share insights that we learn through our study with the PI's of the new project.

Based on interaction to date between the two research teams, we would welcome

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the opportunity to collaborate and further interact with the PI's of this new study if it is funded.

Sincerely,

Sandra C. Greer

Sandra C. Greer
Professor
Department of Chemical and Biomolecular Engineering
Department of Chemistry and Biochemistry
University of Maryland
College Park, MD 20742

National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230

Dear National Science Foundation,

I am writing to strongly endorse the EESE proposal submitted by Dr. Ken Fleischmann from the College of Information Studies along with his colleagues, Drs. Russ Robbins and Al Wallace. This is an important study which I believe can greatly benefit the graduate programs in our College, as well as students across the nation. Within the College of Information Studies, students from the Master of Library Science and the Master of Information Management programs specifically will benefit from this research. In my experience, all too often faculty everywhere focus on the design and functionality of technology and they overlook or pay too little attention to ethical issues. However, like many other colleges and departments across the country, we are placing an increasingly high value on encouraging students to consider the ethical issues concerned with technology design and use. Often this takes the form of discussion but for some time I have wanted our faculty to include simulation activities that require students to evaluate ethical issues in a more realistic manner. The work proposed by Dr. Fleischmann and his colleagues has the potential to achieve this goal. Even more significant, this work provides a practical example that others can use or emulate. This is why the simulation and course developed described in this proposal will significantly benefit our graduate programs and those studying in similar programs across the nation and the world.

I also want to emphasize my confidence and support for Dr. Ken Fleischmann. He has already demonstrated strong potential as a researcher, educator, and leader. I was pleased to appointment him to the faculty of the College of Information Studies in January 2007. For personal reasons, Dr. Fleischmann has moved to three different universities during his three years as an Assistant Professor. This would be daunting for anyone, but on each occasion he has used the opportunity to develop new courses and skills while maintaining his research direction and high research productivity. As soon as Dr. Fleischmann joined our college, he became involved in developing the curriculum for a new undergraduate minor in informatics, and within a very short time he was leading this activity. In addition, he has already developed and received approval from the College's Curriculum Committee to teach a graduate course on information ethics that will serve as the cornerstone of this EESE proposal. Dr. Fleischmann has also had significant success with NSF, which has already led to several publications in well-rated journals in this field. Dr. Fleischmann is clearly on the road to becoming an excellent scholar, teacher and researcher, and I encourage you to fund this proposal so that he can undertake this study.

Sincerely,

Jennifer Preece, Ph.D.

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UNIVERSITY OF MARYLAND

INSTITUTIONAL REVIEW BOARD

2100 Blair Lee Building
College Park, Maryland 20742-5121
301.405.4212 TEL 301.314.1475 FAX
irb@deans.umd.edu
www.umresearch.umd.edu/IRB

April 2, 2007

MEMORANDUM

Application Approval Notification

To:	Dr. Kenneth R. Fleischmann College of Information Studies
From:	Roslyn Edson, M.S., CIP IRB Manager University of Maryland, College Park
Re:	**IRB Application Number:** 07-0150 **Project Title:** "Educational Simulation for Computing and Information Ethics"
Approval Date:	April 2, 2007
Expiration Date:	April 2, 2008
Type of Application:	Initial
Type of Research:	Non-exempt
Type of Review For Application:	Expedited

The University of Maryland, College Park Institutional Review Board (IRB) approved your IRB application. The research was approved in accordance with 45 CFR 46, the Federal Policy for the Protection of Human Subjects, and the University's IRB policies and procedures. Please reference the above-cited IRB application number in any future communications with our office regarding this research.

Recruitment/Consent: For research requiring written informed consent, the IRB-approved and stamped informed consent document is enclosed. The IRB approval expiration date has been stamped on the informed consent document. Please keep copies of the consent forms used for this research for three years after the completion of the research.

Continuing Review: If you intend to continue to collect data from human subjects or to analyze private, identifiable data collected from human subjects, after the expiration date for this approval (indicated above), you must submit a renewal application to the IRB Office at least 30 days before the approval expiration date.

Modifications: Any changes to the approved protocol must be approved by the IRB before the change is implemented, except when a change is necessary to eliminate apparent immediate hazards to the subjects. If you would like to modify the approved protocol, please submit an addendum request to the IRB Office. The instructions for submitting a request are posted on the IRB web site at: **http://www.umresearch.umd.edu/IRB/irb_Addendum%20Protocol.htm.** *(continued)*

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Unanticipated Problems Involving Risks: You must promptly report any unanticipated problems involving risks to subjects or others to the IRB Manager at 301-405-0678 or **redson@umresearch.umd.edu.**

Student Researchers: Unless otherwise requested, this IRB approval document was sent to the Principal Investigator (PI). The PI should pass on the approval document or a copy to the student researchers. This IRB approval document may be a requirement for student researchers applying for graduation. The IRB may not be able to provide copies of the approval documents if several years have passed since the date of the original approval.

Additional Information: Please contact the IRB Office at 301-405-4212 if you have any IRB-related questions or concerns.

April 4, 2007

Dear Reviewer:

I have reviewed the Project Description of the NSF proposal entitled Educational Simulation for Computing and Information Ethics to be submitted by Professors Fleischmann, Robbins and Wallace, and am happy to provide the opportunity to offer a course on information and computing ethics for the students in our Information Technology Master's Program. In fact, I have been looking for a course on information and computing ethics to add to the curriculum, and this proposal fills that void.

Rensselaer's Master of Science in Information Technology balances the study of management strategies and technology leadership with advanced course work in an IT concentration. Students complete a suite of Core and Capstone courses, and also select three to five additional courses to complete their Concentrations. Programs are individually tailored to accommodate a variety of entering backgrounds and career goals. The Master of Science in IT can be completed with two terms of intensive study.

I support the proposed research and agree that this educational material is needed for the preparations of information and computing professionals.

Sincerely,

David L . Spooner
Associate Dean of Science and Information Technology

Institutional Review Board

Date: March 29, 2007

To: William A. Wallace
          Decision Sciences and Engineering Systems
          CII 5015
          Rensselaer Polytechnic Institute
          110 8th Street, Troy, NY 12180

Re: Renewal of your protocol **#722** entitled **"Educational Simulation for Computing and Information Ethics"**

Action: **Approved for renewal**

Should you wish to modify the protocol from that submitted, it will be necessary to submit a description of the proposed modification for a re-determination by the Board.

The above approval is contingent upon your agreement to obtain written informed consent in the approved form; it is also contingent upon your agreement to maintain a file of the signed consent forms as well as a list of the names of all subjects studied with an identifying address for each.

Annually from the date of this notice and at the completion of the project, it will be necessary to submit to the Board a statement containing your assurance that you have obtained written informed voluntary consent from your subjects in the approved form and that you have maintained the above required list.

The review of this protocol and consent form has been made only with regard to DHHS regulations and New York State Law. If a part of this project is to be conducted under another jurisdiction, the Board cautions that it may be necessary to determine if the protocol conforms to the requirements of that jurisdiction. *This review is valid for one year from the above review completion date.*

Sincerely,

Chair, Institutional Review Board

CC: Denise Clark

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MARIST

April 4, 2007

The National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230, USA

Dear Program Officers and Proposal Reviewers:

Marist College is pleased to make a commitment to support Dr. Russ Robbins'
participation in the project entitled "Collaborative Research: Educational
Simulation for Computing and Information Ethics," proposed to the National
Science Foundation's Ethics Education in Science and Engineering program. Dr.
Robbins is a faculty member in Marist College's Computer Science, Information
Systems, and Information Technology department. I fully support this research
and am particularly impressed with the way that Dr. Robbins has integrated his
research and teaching. Not only will this scholarship inform and support his
teaching, but it will also involve Marist undergraduate and graduate students in
research.

School of Computer Science
and Mathematics
Marist College
Poughkeepsie, NY
12601-1387
telephone: 845-575-3000

Dr. Robbins' proposal is a solid reflection of Marist College's mission. The
College's mission statement encourages faculty to help students develop the
intellect and character required for enlightened, ethical, and productive lives in
the global community of the 21st century. Marist further seeks to distinguish itself
by the manner in which it uses information technology to support teaching,
learning, and scholarship at both the undergraduate and graduate levels. Dr.
Robbins' proposal embodies these ideals.

I am delighted that Dr. Robbins has collaborated with the University of Maryland
– College Park and Rensselaer Polytechnic Institute in this unique endeavor to
develop a simulation and course for graduate-level professional computing and
information ethics education.

Sincerely,

Roger L. Norton
Dean, School of Computer Science and Mathematics

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MARIST

MARIST COLLEGE INSTITUTIONAL REVIEW BOARD

MEMORANDUM

To: Russell W Robbins
Subject: Building and Assessing a Piece of Software and Course that
           Teaches Students Information Ethics
Date: April 4, 2007

In accordance with federal regulations, the Marist College Institutional Review Board has been given the authority by President Dennis Murray to act on the above-referenced protocol.

After reviewing your protocol, the IRB has determined that it involves human subjects who will not be at risk and has given approval effective immediately.
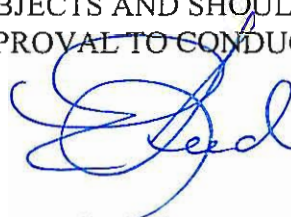
This approval applies only to the above-referenced protocol. It is incumbent on you to secure prior approval of the Board for any changes in your proposed procedures that will affect your use of human subjects. You must also report to the Board any problems that arise in connection with your use of human subjects in this activity.

This approval is valid for ONE YEAR ONLY. You must request a continuation of the approval if the activity lasts more than one year.

If you question any of these determinations, you have the option of requesting a full review by the IRB which will make the final determination.

NOTE: The IRB may request a full review to reconsider any protocol approved under expedited review. You will be notified in advance of this review.

APPROVAL OF THIS PROTOCOL BY THE IRB ONLY SIGNIFIES THAT THE PROCEDURES ADEQUATELY PROTECT THE RIGHTS AND WELFARE OF THE SUBJECTS AND SHOULD NOT BE TAKEN TO INDICATE COLLEGE APPROVAL TO CONDUCT THIS RESEARCH.

Elizabeth L. Teed. Ph.D.
Assistant Professor, Psychology
Chair, IRB

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