

COLLEGE OF ENGINEERING BIOGRAPHICAL DATA
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Department (% appointment) Aerospace Engineering (100%)

Date 02/16/07

1. Name Neogi Natasha Anita Date of Birth 12/29/1977
(last) *(first)* *(middle)*
Citizenship Canadian

2. Present Academic Rank Assistant Professor 3. Tenure Status (*as listed in the budget*) Untenured

4. Administrative Title (*if any now held*) _____

List the following information, in chronological order from past to present. (attach additional pages, as needed)

5. Degrees (*field, institution, year awarded*)

B.Eng. Honours, Mechanical Engineering, McGill University	June 1996
B.Sc. Honours, Physics, Cambridge University	Nov. 1998
M.Phil., Physics, Cambridge University	Nov. 1998
M.Sc., Aeronautics and Astronautics, Massachusetts Institute of Technology	June 1999
Ph.D., Aeronautics and Astronautics, Massachusetts Institute of Technology	June 2002

6. Academic Positions at U of I and elsewhere (*rank, institution, inclusive dates*)

Assistant Professor (100%) Aerospace Engineering, University of Illinois at Urbana-Champaign	August 2002-present
Affiliate Professor (0%) Institute for Aviation, University of Illinois, Urbana-Champaign	December 2004-present
Affiliate Professor (0%) Coordinated Sciences Laboratory, University of Illinois, Urbana-Champaign	December 2004-present
Affiliate Professor (0%) Electrical and Computer Engineering, University of Illinois at Urbana-Champaign	October 2002-present
Affiliate Professor (0%) Computer Science, University of Illinois at Urbana-Champaign	February 2003-present
Postdoctoral Research Fellow Aeronautics and Astronautics, MIT	February 2002-August 2002

7. a. Other Professional Employment (*title, organization, location, inclusive dates*)

b. Major Consulting Activities (*past five years*) (*list organization and location*)

c. Professional Registrations (*field, location, date*)

8. Honors, Recognition and Outstanding Achievements (*list year*)

- a. Teaching
- b. Research
- c. Public Service

FACTUAL INFORMATION

A. Resident Instruction and Continuing Education

1. Resident Instruction (*see attached report*)

2. Continuing Education (*credit courses only*)

<u>Year</u>	<u>Course</u>	<u># of Students</u>	<u>Delivery Method</u>
	3. Other Instructional Activities (<i>prelim and final exams, course development, short courses, etc.</i>)		
	Developed course AE 498 IT (Spring 2005) Information Technology		
	Co-Developed course AE 491 (Spring 2004) Distributed Systems with Prof. Frazzoli		
	Developed course AE 498 SSS (Fall 2003) Software and System Safety		
	Developed lab design portion of AE 419 (Spring 2003) Aircraft Flight Mechanics		

4. Undergraduate Advising

a) academic advising 18 (*number of students, current year only*)

b) student organizations (*list past five years*)

Faculty advisor to Mars Society Undergraduate Research

Faculty advisor to Society of Automotive Engineers, UIUC Aero West Chapter, Sept. 2002-present.

Society of Women Engineers, Co-Faculty Advisor, Dec 1, 2005-present

c) design teams (*past five year*)

Faculty advisor to Mars Desert Research Station (UAV flight Project)

Faculty advisor to SAE Aero-West Design Team, Sept. 2002-present

Computer Consultant to DBF Team, Sept 2005-present

d) other (*individual projects, engineering open house, etc. past five year*)

Advised/Advising special project(s) for the following Aerospace Students:

Jung Her, Yee-San Lee, Ian Kaufman, John Brandt

Participated in NASA UROP Summer Internship program by Advising Keerti Bhamapadi, Ian Kaufman, Chung Ngan

Assisted in Undergraduate Seminars for Women in Science and Engineering (GAMES) project

Leadership Coach for Leadership Center

B. Research, Creative, and Other Scholarly Activities

1. List publications in print or accepted, with authors' names ordered the way they appear on the publications. Provide inclusive page numbers for papers in proceedings and journals. Follow the outline given below for the organization of the list of publications. Within each category place items in chronological order. Place a single asterisk(*) before any publication which has undergone stringent editorial review by peers. Place a double asterisk(**) before any publication which was invited and carries with it prestige and recognition. Place an s before any publication based on your work as a student. Indicate by ! up to five publications that you consider to represent your most important contribution of the past decade.

a₁. Books Authored or Co-Authored, Original Editions

a₂. Books Authored or Co-Authored, Revisions

b₁. Books Edited or Co-Edited, Original Editions

b₂. Books Edited or Co-Edited, Revisions

c. Chapters in Books

*! Neogi, N. A., Sanders, W.H., Joshi, K., Dynamic Partitioning of Large Discrete Event Biological Systems for Hybrid Simulation and Analysis, Rajeev Alur, George J. Pappas (Eds.): Hybrid Systems: Computation and Control, 7th International Workshop, HSCC 2004, Philadelphia, PA, USA, March 25-27, 2004, Proceedings. Lecture Notes in Computer Science 2993 Springer 2004. pp. 463-476.

s* D. Newman, N. Neogi, Orbital Mechanics, In Interactive Aerospace Engineering and Design, McGraw Hill, Boston, 2002. pp. 195-213.

d. Monographs [longer than an article, but shorter than a book]

e₁. Articles in Journals

* N. Neogi, "Designing Trustworthy Networked Systems: A Case Study of the National Airspace System", AIAA Journal of Computing, Information, and Communication, accepted April 2006, est. to appear Summer 2007.

*! D. Harikopolou, and N. Neogi, "Polynomial Time Feasibility Condition for Multi-Class Aircraft Sequencing on a Single Runway Airport", IEEE Journal on Intelligent Transportation Systems, accepted June 2006, to appear Nov 2007.

* A. Naseri and N. Neogi, "Using Hidden Markov Models to Detect Mode Changes in Aircraft Flight Data", IEEE Journal of Systems, Man and Cybernetics, accepted August 2006, to appear Oct 2007.

* S. Jiang, P. Voulgaris and N. Neogi, "Failure Robust Distributed Controller Architectures", International Journal of Control, accepted for publication November 2006.

*! E. Rantenen, A. Naseri, and N. Neogi, "Evaluation of Airspace Complexity and Dynamic Density Metrics Derived from Operational Data", Air Traffic Control Quarterly, accepted January 2007, to appear July 2007.

* J. Park, N.S. Namachchivaya, and N. Neogi, "Optimal Prediction and Stochastic Averaging", Journal of Vibration and Acoustics, submitted April 2006, accepted April 2007, to appear Fall 2007.

e₂. Articles in Conference Proceedings

A. Ortiz and N. Neogi, "Optic Flow: A Computer Vision Approach to Object Avoidance on UAVs", IEEE Digital Avionics Systems Conference, Portland, Oregon, October 16-19, 2006.

D. Uhlig, K. Bhamidipati, and N. Neogi, "A Safety-Oriented Approach to Designing UAVs using COTS Technology", IEEE Digital Avionics Systems Conference, Portland, Oregon, October 16-19, 2006.

A. Naseri, and N. Neogi, "Using Hidden Markov Models to Detect Mode Changes in Aircraft Flight Data for Conflict Detection Purposes", IEEE Conference on Systems, Man and Cybernetics, Taipei, Taiwan, October 8-11, 2006.

B. McGuire, and N. Neogi, "Bounding Overapproximations of Reachable Sets in Aircraft Conflict Detection", AIAA Guidance, Navigation, and Control Conference, Keystone, CO, August 21-24, 2006.

A. Naseri, and N. Neogi, "Stochastic Hybrid Models with Applications to Air Traffic Management", AIAA Guidance, Navigation, and Control Conference, Keystone, CO, August 21-24, 2006.

N. Neogi, "Developing Conflict Detection Techniques for a Safe and Reliable Network of Uninhabited Aerial Vehicles", International Conference on Dependable Systems and Networks, Philadelphia, PA, June 25-28, 2006.

B. McGuire and N. Neogi, "Ellipsoidal Approximation of Reachable Sets for the Steady Climbing Turn Maneuver", AIAA Guidance, Navigation, and Control Conference, San Francisco, CA, August 15-18 2005.

- D. Harikiopolou, and N. Neogi, "Class Dependent Sequencing of Aircraft for Landing on Multiple Runway Systems", IEEE Conference on Intelligent Transportation Systems, Vienna, Austria, September 13-16 2005.
- N. Neogi, "Air Traffic Conflict Detection and Resolution: The Art of Developing a Hybrid Model for Humans, Software and Aircraft Dynamics and Control", IEEE International Conference on Systems, Man and Cybernetics, Hague, The Netherlands. October 10-13 2004.
- B. McGuire, and N. Neogi, "Verifying Correctness of Conflict Detection Devices in the Presence of Uncertain Dynamics", AIAA 1st Intelligent Systems Technical Conference, Chicago, IL. September 20-22, 2004.
- D. Harikiopolou and N. Neogi, "Simplified Aircraft Runway Assignment: An Execution Policy for Handling Multi-Class, Multi Server Systems", AIAA 1st Intelligent Systems Technical Conference, Chicago, IL, September 20-22, 2004.
- s* N. Neogi, N. Leveson, and N. Lynch, "A Hazard Elimination Algorithm for Hybrid Systems", EMSOFT, Pisa, Italy, September 3-8, 2004.
- N. Neogi, "Utilizing the Structure of Safety Properties to Aid in the Verification of Hybrid Controllers", American Conference on Control, Boston, MA, June 30-July 2, 2004,
- N. Neogi, "Dynamic Partitioning of Large Discrete Event Biological Systems for Hybrid Simulation and Analysis", Rajeev Alur, George J. Pappas (Eds.): Hybrid Systems: Computation and Control, 7th International Workshop, HSCC 2004, Philadelphia, PA, USA, March 25-27, 2004.
- N. Neogi, "Optimizing the Relationship between Missed Detections and False Alarms during the Verification of Conflict Detection Schemes", Digital Avionic Systems Conference, Indianapolis, IN, October 12-16, 2003.
- s* N. Neogi, N. Leveson, "Eliminating Hazards from a Medium Term Conflict Detection Tool", AIAA Guidance, Navigation and Control Conference, Austin, TX, August 11-14, 2003.
- N. Neogi, "Designing Trustworthy Networked Systems: A Case Study of the National Airspace System", International System Safety Conference, Ottawa, Canada, August 3-11, 2003.
- M. de Villepin, N. Neogi et al., "A Safety and Human-Centered Approach for Developing New Air Traffic Management Tools", FAA/Eurocontrol R&D Seminar ATM-2001, December 4-7, 2001.
- P. Anderson, N. Neogi et al. Formal Requirements Specifications and Analysis of an Autonomous Helicopter using SpecTRM-RL, ICSSEA, Paris 1999.
- f. Publications in above categories which have been submitted for publication but not yet accepted.
- N. Neogi, and B.M McGuire, "Optimizing Ellipsoidal Techniques", SIAM Journal on Control and Optimization, Special Issue on Control and Optimization in Cooperative Networks, submitted November 2006.
- Bojanowski, Luc, Harikiopolou, Dimitri, and N. Neogi, "Multi-Class and Multi-Runway Sequencing at Congested Airports", IEEE Journal on Intelligent Transportation Systems, submitted April 2006, reviewed and resubmitted February 2007.
- N. Neogi, "Designing Safety and Security into Aerospace Systems", IEEE Transactions on Dependable and Secure Computing, submitted April 2006, reviewed Feb 2007 .
- A. Naseri and N. Neogi, "Stochastic Hybrid Models with Applications to Air Traffic Management", AIAA Journal of Guidance, Dynamics and Control, submitted January 2006, reviewed October 2006.

B. McGuire and N. Neogi, "Bounding Overapproximations of Reachable Sets", AIAA Journal of Guidance, Dynamics and Control, submitted November 2005, reviewed July 2006, resubmitted December 2006.

** A Brief Introduction to State Machines, N. Neogi, in A New Approach to System Safety Engineering, N. G. Leveson, Prentice-Hall, submitted 2005, edited October 2006, resubmitted Jan 2007.

g. Other (*patents, designed and marketed software, magazine articles, etc.*)

2. Grants, contracts and gifts received for your research and teaching
(in chronological order for past ten years)

a) For Research

Year (Duration)	Title	Source and Amount	# PIs
2006 (1 year)	Critical Research Initiative: Centre for Air Transportation Systems Research (co-PI)	OVCR-\$80,000 \$27,000 per PI	3
2006-08 (2 years)	ONR Range UIUC UAV Demonstration (PI)	Boeing Corp-\$67,000 \$67,000 per PI	1
2006-11 (5 years)	Ensuring Safety and Security in Software Intensive Aerospace Systems (PI)	Boeing Corp-\$127,000 \$63,500 per PI	2
2005-6 (1 year)	Simulating Large Discrete Event Biological Systems Using Hybrid Models (co-PI)	Pioneer Corp-\$125,000 \$62,500 per PI	2
2003-8 (5 years)	ITR: Collaborative Research: Efficient Resource Management for Controlled-Mobility Wireless Networks (PI)	NSF-\$1,027,003 \$65,000 per PI per year	5
2003-6 (3 years)	Creating An Integrated Modular Environment for the Modelling, Analysis and Verification of Embedded Hybrid Systems (PI)	NSF-\$170,000 \$85,000 per PI per year	2

b) For Instruction

Year (Duration)	Title	Source and Amount	# PIs
2006 (1 year)	NASA Educational Grant (co-PI)	NASA-\$3,000 per PI	5

3. Areas of Research (*brief description, key words are adequate*)

Computation, communication and control in hybrid systems
 Designing Safety and Security in Aerospace Systems
 Verification and Validation of real time embedded systems
 Performance and availability of distributed networks
 Making formal methods practical/usable for non-experts
 Human-computer interaction and accident analysis

4. Graduate Thesis Research Advising in the Past Five Years (*list co-advisor, if any*)

(a) MS Degrees Granted (*name and year*)

Kenneth Lu (co-advisor Prof. Leveson)	2002, MIT
Dimitri Harikiopolou,	2004, UIUC
Benjamin McGuire,	2005, UIUC

(b) MS Thesis Students Supervised at Present (*name*)

Keerti Bhamidipati, expected 2007, UIUC
 Andres Ortiz, expected 2007, UIUC

- (c) PhD Degrees Granted (*name and year*)
- (d) PhD Thesis Students Supervised at Present (*name*)
 - Benjamin McGuire, expected 2008, UIUC
 - Asal Naseri, expected 2008, UIUC

5. Editorships of Journals or Other Learned Publications

7. Post-doctoral Associates and Visiting Scientists (>3 months stay) in the past three years (*list name, year(s), country of origin, permanent employer*)

Luc Bojanowski, 2005-6, France, École Supérieure d'Électricité, Paris

8. Other Scholarly Activities in the past five years (*conferences organized or chaired, unpublished presentations, etc.*)

Organized:

Program Committee, AIAA InfoTech Conference on Intelligent Systems, Sonoma, CA, 2007

Program Committee, IEEE Conference on Robotics, Communications and Control, Athens, Greece, 2007

Program Committee, IEEE 12th Workshop on Dependable Parallel, Distributed and Network-Centric Systems, Edinburgh, Scotland, 2007

Chaired sessions in:

Allerton Conference on Communication and Control, Distributed Control in Air Traffic Applications, 2006

Allerton Conference on Communication and Control, Distributed Control in Air Traffic Applications, 2005

System Safety Symposium 2005, Formal Methods Track

System Safety Symposium 2004, Verification and Validation Track

DASC; Software Engineering Track; 2003

DASC; Software Engineering Track; 2002

System Safety Symposium, 2002

Reviewer for:

IEEE Conference on Dependable Networked Systems

American Institute of Aeronautics and Astronautics (AIAA) Journal; Information Technology

Conference on Decision and Control

American Controls Conference

Hybrid Systems: Computation and Control Conference

IEEE Transactions on Automatic Control, special edition on Symbolic and Automatic Control

C. Service in the Past Three Years

1. Professional Society (*list membership; office held, with dates; major committees or boards*)

AIAA, Software Systems Technical Committee Member, May 2006-present

IEEE, member

2. University (*department, college and campus committees, administration, etc. for past five years*)

Administrative Duties at UIUC

Provost's Blue Ribbon Panel on the Aviation Institute Committee 07-present

Departmental Planning Committee, 05-06

Engineering-Computer Science Liaison Committee, 04-05

Qualifiers Committee, Department of Aerospace Engineering, 04-05

Faculty Search Committee, Department of Aerospace Engineering, 03-05

Faculty Search Committee, Coordinated Sciences Laboratory, for Ad-Hoc IT position, 03-05

Climate Committee Study, Faculty of Engineering, 03-04

Honours Students James Scholar Committee, 02-04
Computer Committee, Department of Aeronautics and Astronautics, '02-04
Scholarship Committee, Department of Aeronautics and Astronautics, '02-04
Undergraduate Curriculum Review for the Department of Computer Science, '02-03

3. Federal and State (*government commissions or panels, community, industrial extension, etc.*)
National Science Foundation Panel Reviewer: Panel on Embedded and Hybrid Systems, February 23-24
2006.
National Science Foundation Panel Reviewer: Panel on Embedded and Hybrid Systems, February 24-25
2005.
Information Trust Institute Panel Review, December 3-5, 2005
National Science Foundation Panel Reviewer: Panel on Embedded and Hybrid Systems, February 22-24
2004.
4. Other Outside Service
John Enright (external committee member) 2004, MIT

Improvement Activities (*List any specific programs in which you have participated to improve teaching and professional competence*)

Peer Evaluation for Teaching Evaluation, Center for Teaching Excellence, UIUC, Videotaped Lecture and Review
Spring 2005
Peer Evaluation for Teaching Evaluation, Office of Instructional Resources, UIUC, Videotaped Lecture and Review
Fall 2005
Peer Evaluation for Teaching Evaluation, Office of Instructional Resources, UIUC, Videotaped Lecture and Review
Spring 2004
FastStart Early Faculty Seminar, August 21-28, 2003
Peer Evaluation for Teaching Evaluation, Office of Instructional Resources, UIUC, Videotaped Lecture and Review
Fall 2003
Peer Evaluation for Teaching Evaluation, Office of Instructional Resources, UIUC, Videotaped Lecture and Review
Spring 2003
Peer Evaluation for Teaching Evaluation, Office of Instructional Resources, UIUC, Videotaped Lecture and Review
Fall 2002