

The Fifth Grace Hopper Celebration: Making History, celebrating the impact of women – past, present, and future – on computing.

Women@IT: Graduate Education, The Next Big Thing

Anastassia Ailamaki, Lenore Blum, M. Bernardine Dias, Carol Frieze, Manuela Veloso, and PhD Students from Robotics, Language Technologies and Computer Science

**School of Computer Science
Carnegie Mellon University**

The next generation of IT professionals will be drawn from the upcoming generations of IT students. The future of this field, including its potential to transform society, will be shaped by these students. Thus, it is critical to attract and promote students who will be future leaders and visionaries and bring diverse perspectives to the table. The theme of our proposed session is: *increasing the pool of women students in graduate CS/IT programs and positioning them to become future university CS/IT faculty and leaders in the field.*

Top tier schools of computer science have undergraduate populations hovering in the range of 10% to 20% for women. At the graduate level, data gathered by the Taulbee Survey (2000-2001) from 173 Ph.D. granting departments show women represent 19% of students in computer science and computer engineering (16% graduate with PhDs). At the faculty level, only 15% of the new tenure-track faculty are female and at the full professor level, only 8% are female.

In this three part panel session, we plan to present a program of strategies for recruitment, retention and community building at the graduate level. This program is designed and implemented by faculty and graduate students from Women@SCS, (<http://women.cs.cmu.edu>) a dynamic community of women in computing at Carnegie Mellon University (CMU). We will focus in particular on our Graduate Outreach Roadshow project, which we hope will be a model for other groups looking to engage in similar activities. We will encourage discussion about the overall feasibility, effectiveness, and appropriateness of this and other strategies for involving women in computer science at the graduate level and beyond.

Session Length: 1 ½ hrs

Audience: This panel will be of interest to anyone working to increase the participation of women in computer science, especially at the graduate level. The Graduate Outreach Roadshow, will be particularly interesting to current undergraduates and to faculty and graduate students looking to create a similar program of their own. (Session attendees will be given a copy of our Roadshow brochure that is distributed at our presentations.)

PROGRAM:

Part 1 of our session will explain our goals and a description of the new Women@IT enterprise.

Part 2 will consist of a demonstration of the Graduate Outreach Roadshow.

Part 3 will comprise a panel discussion on the dynamics, issues and challenges involved.

PART 1. Women@IT: Introduction, Strategies for Recruitment, Retention and Community Building at the Graduate Level

In the first part of our program we will introduce the components of the Women@IT enterprise. These include (but are not limited to):

- Implementing outreach strategies to undergraduate college faculty and students,

Wome@IT

- Encouraging applications from students who might not have extensive prior CS experience but who want to integrate CS/IT with their strengths in other disciplines,
- Providing first year fellowships for high potential non-traditional students to enable them to immerse themselves in CS/IT along with an initial buffer year for such students (with tailored courses and appropriate advising),
- Extending the role of Women@SCS to Women@IT for current and future students by providing additional professional training and experiences targeted to enhance potential careers in academia and as leaders in the profession along with community building (social, academic and professional),
- IT summer Workshops for college faculty.

PART 2. The Graduate Outreach Roadshow

In this part of the program our graduate students will present one of our newest and most exciting strategies -- the Graduate Outreach Roadshow. This presentation is an extension of the successful Outreach Roadshows developed by Women@SCS initially for middle school children in the Spring 2002. Since then, teams of graduate and undergraduate students have demonstrated the Roadshow to local middle and high school teachers and students, and presented the Roadshow at the 2003 Richard Tapia Celebration of Diversity in Computing. All versions of the Roadshow share these goals: *to increase role modeling and the visibility of young women in computer science, to challenge the traditional stereotypes of what/who computer scientists are, to show the breadth of fields that computer science can encompass, to provide an interesting and enjoyable learning experience, to provide leadership/mentoring opportunities for our young women computer science students.*

The graduate Roadshow adds a scholarly and technically sophisticated dimension to the presentation to meet the needs of presenters and audience. It is delivered by graduate students from different disciplines of computer science and is designed for an audience of undergraduate juniors and seniors. It consists of four talks (approx. 15 mins each) given by graduate students about their background, research areas, and motivations for going to graduate school, followed by a question and answer sessions for students who have specific questions about the application process and graduate school experience.

The Graduate Outreach Roadshow serves several purposes:

- to make undergraduates aware of the exciting research opportunities available for women in graduate school,
- to provide a forum for graduate women to gain speaking and leadership experience,
- to inform undergraduates of scholarships and funding opportunities for financing graduate education, and
- to reach out to outstanding students from fields outside of computer science, for example, mathematics, biology, physics or psychology, who may want to integrate their expertise with computing-related disciplines.

We believe that the Graduate Roadshow provides undergraduate women with strong graduate-student role-models and makes the graduate school application process less intimidating; it is a useful supplement to graduate school counseling that undergraduate students have available at their home university.

PART 3. Panel Discussion:

The final part of our program will consist of a panel of faculty and graduate students who will discuss the dynamics, issues and challenges involved in the Women@IT enterprise. They will also answer questions and comments.

BIOGRAPHIES

Program Moderator: Professor Lenore Blum

Speakers (Part 1): Lenore Blum and M. Bernardine Dias

Roadshow (Part 2): Introduction by Carol Frieze, Director Women@SCS; Roadshow

Presentation by PhD students Gita Sukthankar, Stefanie Tomko, Cristen Torrey, Xuejing Chen

Panelists (Part 3): Faculty: Manuela Veloso, Natassa Ailamaki; PhD students: Ariadna Font Llitjos, Alison Alvarez.

Anastassia (Natassa) Ailamaki is an Assistant Professor in the Computer Science department. She received a B.Sc. degree in Computer Engineering (1990) from the Polytechnic School of the University of Patra, Greece, M.Sc. degrees from the Technical University of Crete, Greece and from the University of Rochester, NY, and a Ph.D. in Computer Science from the University of Wisconsin-Madison. Her recent work on cache-conscious data placement received a best-paper award in VLDB 2001. Her current research interests include database system design and performance, cache-resident databases, internet querying and caching, workload characterization, and scientific workflow management systems. Natassa has also been a CRA-W mentor.

Alison Alvarez is a PhD student in the Language Technologies Institute in the School of Computer Science. She has a degree in Computer Science and Japanese Language/Literature from the George Washington University in Washington, DC. She has won numerous scholarships including the Jack Kent Cooke Scholarship, the National Science Foundation Graduate Fellowship, and the Goldwater Scholarship. She is currently working on a project to preserve minority languages around the world. Her research interests are in computational linguistics and artificial intelligence with a focus on language elicitation and sentence generation. She was born and raised in Jonesboro, Georgia.

Lenore Blum is *faculty advisor for Women@SCS* and *co-Director of Women@IT*. Lenore joined the Carnegie Mellon faculty in the Fall of 1999 as *Distinguished Career Professor of Computer Science* where she is also *co-Director of the NSF funded ALADDIN Center* for ALgorithm ADaptation, Dissemination and INtegration. She started her career in higher education as a freshman at Carnegie Tech in 1959 (taking the first programming course given by Allan Perlis in 1960) and later received her PhD from MIT (in 1968, the year Princeton first allowed women to apply to their graduate school). For over 30 years, she has created programs to increase the participation of girls and women in scientific and technical fields and co-founded many proactive organizations such as the Math/Science Network and its Expanding Your Horizons conferences.

Xuejing Chen is a PhD student in the Computer Science Department (CSD) and a member of the Center for Neural Basis of Cognition (CNBC) between CMU and the University of Pittsburgh. She has a B.S. in Electrical and Computer Engineering from the California Institute of Technology (2003) and is a current recipient of the Bell Labs Graduate Research Fellowship. Her research interests are in visual perception, machine vision and creating artificial, but biologically plausible, visual systems. Currently, she is working on understanding and efficiently coding contextual cues within natural scenes. She was born in China and immigrated to the US at age 8.

M. Bernardine Dias is special research faculty at the Robotics Institute with research experience in technology education, multi-robot coordination, automated navigation, and innovative sensing. She has a Ph.D. (2004) and M.S. (2000) in Robotics from Carnegie Mellon University, PA and B.A. in Liberal Arts with a dual concentration in Physics and Computer Science, and a minor in Women's Studies from Hamilton College, NY (1998). Her administrative responsibilities include building and overseeing collaborative outreach efforts between Carnegie Mellon University and

developing communities around the world. Her long-term career goal is innovating means of developing and disseminating suitable and sustainable technology for empowering developing communities.

Ariadna Font Llitjos is a PhD student in Language and Information Technologies (LTI). She has an B.A. in Translation and Interpreting from Pompeu Fabra University (UPF, 1996), Barcelona, Spain, an M.S. in Cognitive Sciences and Language (UPF, UAB, UB, URV, 1999) and an M.S. in Language and Information Technologies (LTI, CMU, 2001). Her research interests are in natural language processing, machine translation, user interfaces, dialog systems and machine learning methods. Recently, she has been working on the fast deployment of machine translation systems for resource-poor languages, and more specifically on how to use feedback from bilingual users, through an online correction tool, to automatically refine translation rules.

Carol Frieze is *Director of Women@SCS* and *co-Director of Women@IT*. She is a Carnegie Mellon alumna having received a Master of Arts in English and Cultural Studies from the School of Humanities and Social Sciences (H&SS). She taught Cultural Studies in the CMU English department and also worked as a student academic advisor in H&SS. She has a background in inner-city London high school teaching and in hospital teaching. Carol was instrumental in the development of the Outreach Roadshow. Her current research area is the culture of computing.

Gita Sukthankar is a Ph.D. student in the Robotics Institute. She has an A.B. in psychology from Princeton University and an M.S. in Robotics from CMU. She recently returned to CMU after a 2 year stint at the HP/Compaq Cambridge Research Lab, working with the mobile computing group. Her current research project is developing human-like software agents for training simulations.

Stefanie Tomko is a PhD student in the Language Technologies Institute (LTI). She has a B.A.'s in Linguistics and in English from the University of Washington (1996) and an M.S. in Language and Information Technologies from Carnegie Mellon University (2001). Her research interests are in spoken dialog systems, human-computer interaction, and speech recognition and synthesis. Her current work focuses on making it easier for users to know what to say to spoken dialog systems.

Cristen Torrey is an Interdisciplinary PhD student in the Language Technologies Institute. She has a B.A. in Humanities from Pepperdine University (1999) and a MSIT in Learning Sciences from Carnegie Mellon University (2003). Her interests include natural language processing, human-computer interaction, and cognitive psychology. Her research seeks to use negotiation-style dialog systems to expand the capabilities of intelligent tutors.

Manuela M. Veloso is Professor of Computer Science at Carnegie Mellon University. She earned her Ph.D. in Computer Science from Carnegie Mellon in 1992. She also received a B.S. in Electrical Engineering in 1980 and an M.Sc. in Electrical and Computer Engineering in 1984 from the Instituto Superior Tecnico in Lisbon. Prof. Veloso researches in the area of artificial intelligence with focus on planning, control learning, and execution for single and multirobot teams. Her algorithms address uncertain, dynamic, and adversarial environments. Prof. Veloso has developed teams of robot soccer agents, which have been RoboCup world champions several times. She investigates learning approaches to a variety of control problems, in particular the performance optimization of algorithm implementations, and plan recognition in complex data sets. Prof. Veloso is a Fellow of the American Association of Artificial Intelligence. She is Vice President of the RoboCup International Federation. She was awarded an NSF Career Award in 1995 and the Allen Newell Medal for Excellence in Research in 1997. Prof. Veloso will be the Program Chair of the 2007 International Joint Conference on Artificial Intelligence.