2007
Richard

TAPIA

Celebration of Diversity in Computing Conference

October 14-17, 2007 • Orlando, Florida

Passion in Computing, Diversity in Innovation

Sponsors:

Organized by the Coalition to Diversify Computing.
Sponsored by the Association for Computing Machinery,
and the IEEE Computer Society

In cooperation with the
Computing Research Association.

BILL NELSON
FLORIDA

United States Senate
WASHINGTON, DC 20510-0905

October 14, 2007

Dr. Allison Clark, Ph.D.
Co- Director, Seedbed Initiative for Transdomain Creativity
Krannert Center for the Performing Arts- Office of the Director
University of Illinois at Urbana Champaign
500 South Goodwin Avenue
Urbana, Illinois 61801-3788

Dear Dr. Clark and Conference Participants:

Greetings and welcome to the great state of Florida. I am unable to be with you today; however, I am delighted that you chose Orlando to celebrate the fourth Richard Tapia Celebration of Diversity in Computing Conference.

As I am sure you are aware, Florida boasts a diverse community. This blend of culture uniquely influences Florida's technology industry.

As you convene to discuss computing and information technology and present new research and ideas, I want to thank you for your hard work. I also would like to congratulate your organization on its contributions to the nation.

Sincerely,

Bill Nelson

U.S. Senator Bill Nelson

The 2007 Richard Tapia Celebration of Diversity in Computing Conference is organized by the Coalition to Diversify Computing and co-sponsored by the Association for Computing Machinery and the IEEE Computer Society, in cooperation with the Computing Research Association. Held every other year, the conference celebrates the technical contributions and career interests of diverse people in diverse computing fields. The theme of this year's conference is "Passion in Computing, Diversity in Innovation." In honor of Richard A. Tapia, this conference - the fourth event in the series - will highlight innovative research and applications in computing sciences. Researchers will present in a number of areas, particularly in collaborative and emerging technologies, computational mathematics and science, and multidisciplinary activities in computer science. Many of the conference presenters are leaders in their respective fields, representing academic, industrial, and government communities. Leading-edge research and provocative topics will be presented by invited speakers, and during technical papers talks, panel discussions, workshops, posters, and Birds-of-a-Feather sessions. In addition to its technical content, the conference includes presentations on initiatives to increase the number of individuals from underrepresented groups succeeding in computing-based careers. The conference aims to provide an educational and supportive networking environment for underrepresented groups across the broad range of computing and information technology, from science to business to the arts to infrastructure. Organized by a committee of volunteers, the conference is made possible by generous contributions from the supporters listed at the back of this program.

2007
Richard Tapia Celebration of Diversity in Computing Conference

October 14-17, 2007 Orlando, Florida

Passion in Computing, Diversity in Innovation
www.richardtapia.org

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Featured Speakers

Plenary Speaker
9:00-10:00 a.m. Monday
It's Not Just About the Machine!
Shirley Malcom, Head of the American Association for the Advancement of Science (AAAS) Directorate for Education and Human Resources Programs

Plenary Speaker
1:30-2:30 p.m. Monday
Diversity: A Weapon of Mass Construction
Norman Johnson, Chief Scientist at Referentia Systems

Plenary Speaker
9:00-10:00 a.m. Tuesday
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John Leslie King, University of Michigan's Vice Provost for Academic Information and a Professor in the School of Information

Luncheon Speakers
12:15-1:30 p.m. Tuesday
Appreciating Mathematical Computation through Applications to Very Cool Activities
Richard A. Tapia, University Professor and Maxfield-Oshman Professor in Engineering, Rice University
Edward Gonzalez, Ph.D. Candidate, Computational and Applied Mathematics, Rice University
Joseph Sifuentes, National Science Foundation Graduate Research Fellow, Computational and Applied Mathematics, Rice University

Plenary Speaker
Ken Kennedy Distinguished Lecture
1:30-2:30 p.m. Tuesday
Multi-Robot Intelligence
Manuela Veloso, Herbert A. Simon Professor of Computer Science at Carnegie Mellon University

Banquet Speaker
7:00-9:00 p.m. Tuesday
Mentoring across Race and Discipline
Maria Klawe, President of Harvey Mudd College in California

Plenary Speaker
9:00-10:00 a.m. Wednesday
Diversity Is the Key to IT Security at Disney
Anne Kuhns, Director of IT Security, Walt Disney Parks and Resorts

Welcome to the Tapia Conference 2007

It is an honor to welcome you to the fourth Richard Tapia Celebration of Diversity in Computing Conference 2007 in this magical place - Orlando, Florida.

With more than 300 students, professors, and researchers all engaged with one another, this Tapia conference continues to honor the leadership and technical excellence exemplified by Dr. Richard Tapia.

It was Dr. Tapia who first readjusted my own aspirations and set in motion not only my graduate career, but also my current professional work at the national laboratories. We replicate these expectations, supported with technical feedback and guidance, in our closed-door Doctoral Consortium for the next generation of technical leaders. It is Dr. Tapia's enduring expectation that those of us in under-represented groups will serve as leaders and role models. I challenge you all to meet those expectations.

The conference theme, "Passion in Computing, Diversity in Innovation," reflects the euphoric highs and the challenges of our chosen field. We are an inquisitive bunch, exploring, expounding, and sharing our passion for computing with anyone willing to hear our technical paper presentations, view our poster presentations, and witness our robotics operations in competition. But not all the problems we address are technical. We face many challenges in broadening participation in computing, in opening doors and keeping them open. To help achieve these goals, our Technical Program Co-Chairs Dr. Ronald Metoyer and Dr. Tiffani Williams have organized many panels and workshops for sharing ideas, discussing them, and understanding how to improve our computing field.

To advance our thinking on computing in general and diversity in particular, we are proud to have such luminaries as Dr. Shirley Malcom, Dr. Norman Johnson, Dr. John King, Dr. Richard Tapia, Dr. Manuela Veloso, Dr. Maria Klawe, and Ms. Anne Kuhns present distinguished talks that should not be missed.

It has been my pleasure and great privilege to have served as your general conference chair.

Dr. Monica Martinez-Canales
Sandia National Laboratories/California
Tapia Conference 2007 Chair
mmarti7@sandia.gov

Dr. Monica Martinez-Canales is a Principal Member of the Technical Staff in the Computer Sciences & Information Technologies Center at Sandia National Laboratories in Livermore, California. She is team leader of the Decision Making under Uncertainty portfolio in Livermore, which includes research and application support of verification and validation, quantification of margins and uncertainty, risk management and decision-making in complex environments.

While at Sandia, Martinez-Canales has received a Sandia President's Quality Award (Gold), Employee Recognition Award (team), Defense Programs Award of Excellence, Lockheed Martin NOVA Award, and is a 2007 ERA winner for Individual Technical Excellence, which recognized her leadership and contributions to weapons analysis projects. She was also named a 2007 Luminary by HENAAC for her significant contributions to the Hispanic community.

She earned a Ph.D. in Computational and Applied Mathematics from Rice University in 1998. Martinez -Canales received a B.S. in Mathematics from Stanford University in 1992. Prior to entering graduate school, she completed a summer internship at Sandia National Laboratories. After a National Science Foundation Post-doctoral fellowship at Stanford University, she joined Sandia's technical staff in 2000,

Her research interests are in numerical optimization and statistical methods, including optimization under uncertainty, error analysis, design of experiments and decision analysis. She has worked on electrical, mechanical, electromagnetic, thermal, hydrodynamic, geological and biological system applications related to national defense and security.

Meet Professor Richard A. Tapia

Honoring the contributions of Professor **Richard Tapia** and celebrating the technical contributions and career interests of diverse people in all fields of computing.

Richard A. Tapia
University Professor
Maxfield-Oshman Professor in Engineering
Rice University, Department of Computational and Applied Mathematics

The symposium honors the many contributions of Dr. Richard A. Tapia, mathematician and professor in the Department of Computational and Applied Mathematics at Rice University in Houston, Texas. Dr. Tapia is internationally known for his research in computational and mathematical sciences and is a national leader in education and outreach programs. He has authored or co-authored two books and more than 100 mathematical research papers. In addition to his faculty positions, he is also Director of the Center for Excellence and Equity in Education.

Richard Tapia was born in Los Angeles to parents who emigrated from Mexico when they were children, seeking educational opportunities. He was the first in his family to attend college, earning his B.A., M.A., and Ph.D. degrees in mathematics from the University of California, Los Angeles. Due to his efforts, Rice University has received national recognition for its educational outreach programs, and the Rice Computational and Applied Mathematics Department has become a national leader in producing women and underrepresented minority Ph.D.s in the mathematical sciences. Dr. Tapia's honors include: election to the National Academy of Engineering (1992) for his seminal work in interior point methods; being the first recipient of the A. Nico Habermann Award from the Computing Research Association (1994) for outstanding contributions in aiding members of underrepresented groups within the computing community; the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring from President Bill Clinton (1996); appointment by President Clinton to the National Science Board, the governing body of the National Science Foundation (1996); the Lifetime Mentor Award from the American Association for the Advancement of Science (1997); and the establishment of a lecture series to honor Dr. Tapia and African American mathematician David Blackwell at Cornell University (2000). He received the Hispanic Engineer of the Year Award from Hispanic Engineer Magazine in 1996, and was inducted into the Hispanic Engineer National Achievement Awards Conference Hall of Fame in 1997. Hispanic Engineer & Informational Technology Magazine also selected him as one of the 50 Most Important Hispanics in Technology and Business for 2004. That same year Dr. Tapia was inducted into the Texas Science Hall of Fame.

Conference Schedule at a Glance - TAPIA 2007

Sunday, October 14, 2007

7:00 a.m.-7:00 p.m. Registration Open, East Registration Area

Doctoral Consortium (by invitation), Gardenia and Fuchsia Rooms

7:30-8:00 a.m.	Continental Breakfast
8:00-8:15 a.m.	Welcome and Introductions
8:15-9:00 a.m.	**Maria Vicente Bonto-Kane,** "Use of Formal Computational Models for Designing Intelligent Mobile Device Interfaces"
9:00-9:45 a.m.	**Joseph Young,** "A Domain Specific Language for Numerical Optimization"
10:00-10:15 a.m.	Break
10:15 a.m.-11:00 am.	**Huda Khan,** "Developing a Model of Adaptation for Enactment: The Central Role of Adaptation in Teach Expertise and Curriculum Reuse"
11:00-11:45 p.m.	**David Thornton,** "Talking Games: Toward Speech as a Mainstream Modality"
12:00-1:15 p.m.	Lunch
1:15-2:00 p.m.	**Idongesit Mkpong-Ruffin,** "Quantitative Risk Assessment Model for Software Security in the Design Phase of Software Development"
2:00-2:45 p.m.	**Unoma Ndili Okorafo,** "Secure Routing for Directional Optical Sensor Networks"
2:45-3:00 p.m.	Break
3:00-3:45 p.m.	**Ernest Cross,** "Researching Multimodal Augmented Reality Interfaces as a Viable Alternative to 2D and 3D Displays That Improve Task Orientation When Working with a Multitude of Robots"
3:45-4:30 p.m.	**Debbi Howard,** "An Issue of Privacy: Correlations between Users' Attitudes and Online Behaviors"
4:30-5:00 p.m.	Break-out Discussion of Presentations and Writing Skills
5:00-5:30 p.m.	General Discussion and Wrap-up

Tapia 2007 Begins

8:00-10:00 p.m.	Pathways to Career Opportunities Exhibit Open International Foyer
6:00-6:30 p.m.	Scholarship Orientation, Palm Ballroom 3
6:30-8:00 p.m.	Student Orientation, Palm Ballroom 3
8:00-10:00 p.m.	Opening Reception, Palm Ballrooms 1 and 2 Sponsored by Google. Welcome remarks by **Monica Martinez-Canales,** Conference Chair

Monday, October 15, 2007

7:00 a.m.-5:00 p.m. Registration Open, East Registration Area

8:30 a.m.-5:30 p.m. Pathways to Career Opportunities Exhibit Area Open
International Foyer

8:45-9:00 a.m.	Opening Remarks & Announcements by **Ronald Metoyer,** International Ballrooms North and Center
9:00-10:00 a.m.	**Plenary Session I: Shirley Malcom,** "It's Not Just About the Machine!" International Ballroom North and Center
10:00-10:30 a.m.	Break, International Foyer, Sponsored by HP
10:30 a.m.-12:15 p.m.	Parallel Sessions
10:30-11:30 a.m.	**Panel I: Roscoe Giles, Christopher Harris, Richard Tapia,** and **Valerie Taylor,** "If Universities Care So Much about Diversity, Why Do Computing Departments Fail at Retaining Their Underrepresented Minority Students?" International Ballroom Center
10:30-11:30 a.m.	**BOF I: Jeff Forbes and Chad Jenkins,** Robotics Competition Preparation International Ballroom South
10:30 a.m.-12:15 p.m.	**Workshop I (part I): Scott McCrickard, John Kelly, Michael Smith, Marlow Hinton, Clayton Lewis, Maureen Biggers, Byong Lee, George Harrison, Mahmoud Manzoul** and **Azubike Okpalaeze,** "Undergraduate Research in Computing" International Ballroom North
11:30 a.m.-12:15 p.m.	**Panel II: Tiffany Barnes** and **Teresa Dahlberg,** "Innovation in Broadening Participation in Computing: STARS Leadership Corps" International Ballroom Center
12:15-1:30 p.m.	Lunch, On your own
1:30-2:30 p.m.	**Plenary Session II: Norman Johnson,** "Diversity: A Weapon of Mass Construction," International Ballroom North and Center
2:30-3:00 p.m.	Break, International Foyer, Sponsored by HP
3:00-5:30 p.m.	Parallel Sessions
3:00-4:00 p.m.	**Workshop I (part II): Scott McCrickard, John Kelly, Michael Smith, Marlow Hinton, Clayton Lewis, Maureen Biggers, Byong Lee, George Harrison, Mahmoud Manzoul** and **Azubike Okpalaeze,** "Undergraduate Research in Computing" International Ballroom North
3:00-4:00 p.m.	**Workshop II: Jan Cuny,** "What Do We Really Need to Do to Broaden Participation in Computing?" International Ballroom South
3:00-5:30 p.m.	**Workshop III: Vicki Almstrum, Steven J. Condly, Allen Johnson** and **David Klappholz,** "Planning and Executing Real Projects for Real Clients Courses" International Ballroom Center
4:00-5:30 p.m.	**Workshop IV: Tiffani Williams,** "Are They Really Listening? Effective Presentations in Science Settings" International Ballroom South
4:30-5:30 p.m.	**Panel III:** American Competitiveness Initiative International Ballroom North
5:30-6:00 p.m.	Break, On your own
6:00-9:00 p.m.	Student Poster Presentations, Grand Foyer

Tuesday, October 16, 2007

7:00 a.m.-5:00 p.m.	Registration Open, East Registration Area
8:30 a.m.-5:30 p.m.	Pathways to Career Opportunities Exhibit Area Open International Foyer
8:45-9:00 a.m.	Opening Remarks & Announcements **Tiffani Williams,** International Ballrooms North and Center
9:00-10:00 a.m.	**Plenary Session III: John Leslie King,** "kuhl-er-blahynd," International Ballrooms North and Center
10:00-10:30 a.m.	Break, On your own
10:30 a.m.-12:15 p.m.	Parallel Sessions
10:30 a.m.-12:15 p.m.	ACM Student Poster Presentations International Ballroom North
10:30-11:15 a.m.	**Panel IV: Kelley Herndon Ford, Marisol Gamboa, Juan Hernandez, Katie Lewis,** and **Celeste Matarazzo,** "Evolving Careers in Computational Science" International Ballroom South
11:15 a.m.-12:15 p.m.	**BOF II: Raquell Holmes, Cynthia Lanius, Phoebe Lenear, Ann Redelfs,** and **Richard Tapia** "A Change for the Better: Help Create Recommendations for Computing Departments to Retain Students" International Ballroom South
10:30 a.m.-12:15 p.m.	**Workshop V: M. Brian Blake, Joel Branch,** and **Edward Taylor,** "Google Resume Workshop: An Ingredient for Success" International Ballroom Center
12:15-1:30 p.m.	Lunch: **Plenary Talk,** "Appreciating Mathematical Computation through Applications to Very Cool Activities," **Richard Tapia, Edward Gonzalez,** and **Josef Sifuentes** Palm Ballroom 2
1:30-2:30 p.m.	Plenary Session IV: Ken Kennedy Distinguished Lecture, **Manuela Veloso,** "Multi-Robot Intelligence" International Ballroom North and Center
2:30-3:00 p.m.	Break, On your own
3:00-6:00 p.m.	Parallel Sessions
3:00-4:30 p.m.	**Technical Papers Session I** International Ballroom North **Andrea Tapia, Magy Seif El-Nasr, Ibrahim Yucel, Joseph Zupko** and **Edgar Maldonado,** "Engaging Passion for Computing: Using Virtual Gaming Environments to Motivate Girls to Follow IT Career Paths" **Amos Olagunju, Paul Fisher** and **John Adeyeye,** "A Model for Guiding Undergraduates to Success in Computational Science" **Beth Trushkowsky, Kamaria Campbell** and **Jeffrey Forbes,** "An Architecture for a Collaborative Bibliographic Database"
4:30-5:30 p.m.	**BOF III: Tiffany Barnes** and **Teresa Dahlberg,** "Evaluating Diversity Initiatives to Broadening Participation in Computing"
3:00-6:00 p.m.	Robotics Competition Supported by iRobot Poinsettia and Quince Rooms
6:00-7:00 p.m.	Break, On your own
	VIP Reception (by invitation) Camelia and Dogwood Rooms
7:00-9:00 p.m.	**Banquet and Awards Ceremony** Banquet Address by **Maria Klawe,** "Mentoring across Race and Discipline" Palm Ballroom 2 Sponsored by Microsoft

Wednesday, October 17, 2007

7:00-9:00 a.m.	Registration Open, East Registration Area
8:45 a.m.-5:30 p.m.	Bridge Day Activities
8:45-9:00 a.m.	Opening Remarks: **Stuart Feldman,** ACM President International Ballroom North and Center
9:00-10:00 a.m.	Plenary Session V: **Anne Kuhns,** "Diversity Is the Key to IT Security at Disney" International Ballroom North and Center
10:00-10:30 a.m.	Break, On your own
10:30 a.m.-12:15 p.m.	Parallel Sessions
10:30 a.m.-12:00 p.m.	**Workshop VI: Jesse Bemley,** "Preparation of High School Students for Technical Conferences" International Ballroom South
10:30-11:15 a.m.	**Panel V: Eileen McIlvain,** "Engaging Communities through Cyberinfrastructure: Lessons from the National Science Digital Library" International Ballroom North
11:15 a.m.-12:15 p.m.	**BOF IV: Ugochi Acholonu** and **Wanda Eugene,** "Diversity and Computer Science Outreach" International Ballroom North
10:30 a.m.-12:00 p.m.	**Technical Papers Session II** International Ballroom Center **Shannon Duvall,** "Implementation of DomCAT: The Domain Complexity Analysis Tool for Natural Language Dialog Processing" **Guillermo Lopez, Michela Taufer** and **Patricia Teller,** "Evaluation of IEEE 754 Floating-Point Arithmetic Compliance across a Wide Range of Heterogeneous Computers" **Caio Soares, George Page, Jonathan MacDonald, Sanjeev Baskiyar, John Hamilton** and **Gerry Dozier,** "Bowl Championship Series Vulnerability Analysis"
12:15-1:30 p.m.	Town Hall Meeting, Palm Ballroom 2
1:30 p.m.	Adjourn Tapia 2007

Program Highlights

Doctoral Consortium (by invitation)

8:00 a.m.-5:30 p.m. Sunday
Gardenia and Fuchsia Rooms
Supported by the National Science Foundation

The Doctoral Consortium provides an opportunity for Ph.D. students to discuss and explore their research interests and career objectives with a panel of established researchers in computing and in computational mathematics, science and engineering.

Student and Scholarship Recipient Orientation

6:00-6:30 p.m. Sunday
Scholarship Orientation
Palm Ballroom 3
6:30-8:00 p.m. Sunday
Student Orientation
Palm Ballroom 3

At the Student and Scholarship Recipient Orientation, experience and suggestions will be offered to students toward maximizing the benefits of their participation in the Tapia 2007 conference and future professional activities.

Scholarship Recipient Orientation

Poster competition students as well as scholarship recipients are strongly encouraged to attend this session. Scholarship reimbursement procedures and conference participation expectations will be discussed. In addition, questions about submitting reimbursement requests and common mistakes made in the past will be addressed. Prevent reimbursement delays by attending this session.

Student Orientation

All students are invited to attend this pre-conference information session, which is aimed at helping students make the most of their conference experience. Students will be introduced to luminaries, leaders, and representatives from professional societies, academia, national laboratories, and industry. Students will also learn valuable networking skills that can be immediately put to use.

Opening Reception

8:00-10:00 p.m. Sunday
Palm Ballroom 1 and 2
Sponsored by Google

The Opening Reception offers a relaxed setting for the start of the conference. This is an opportune time to meet and network with colleagues, leaders in the field and potential future collaborators. Conference participants will have an opportunity to meet honoree Richard Tapia, a host of speakers and panelists, representatives from our sponsors and supporters, conference organizers and other conference participants.

Plenary Speakers

True to the conference theme, "Passion in Computing, Diversity in Innovation," Tapia 2007 plenary sessions feature presentations on wide ranging topics by diverse leaders in the computing sciences from academia, industry, and government agencies.

It's Not Just About the Machine!

Shirley Malcom, Head of the American Association for the Advancement of Science (AAAS) Directorate for Education and Human Resources Programs
9:00-10:00 a.m. Monday
International Ballroom North and Center

Diversity: A Weapon of Mass Construction

Norman Johnson, Chief Scientist at Referentia Systems
1:30-2:30 p.m. Monday
International Ballroom North and Center

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John Leslie King, University of Michigan's Vice Provost for Academic Information and a Professor in the School of Information
9:00-10:00 a.m. Tuesday
International Ballroom North and Center

Appreciating Mathematical Computation through Applications to Very Cool Activities

Richard A. Tapia, University Professor and Maxfield-Oshman Professor in Engineering, Rice University
Edward Gonzalez, Ph.D. Candidate, Computational and Applied Mathematics, Rice University
Joseph Sifuentes, National Science Foundation Graduate Research Fellow, Computational and Applied Mathematics, Rice University
12:15-1:30 p.m. Tuesday
Palm Ballroom 2

Multi-Robot Intelligence

Manuela Veloso, Herbert A. Simon Professor of Computer Science at Carnegie Mellon University
1:30-2:30 p.m. Tuesday
International Ballroom North and Center

Mentoring across Race and Discipline

Maria Klawe, President of Harvey Mudd College in California
7:00-9:00 p.m. Tuesday
Palm Ballroom 2

Diversity Is the Key to IT Security at Disney

Anne Kuhns, Director of IT Security,
Walt Disney Parks and Resorts
9:00-10:00 a.m. Wednesday
International Ballroom North and Center

Student Poster Presentations

Student Poster Presentations
6:00-9:00 p.m. Monday
Grand Foyer

Poster Semi-Finalist Oral Presentations
10:30 a.m.-12:15 p.m. Tuesday
International Ballroom North

The Tapia 2007 student poster competition is an opportunity for students to present their latest research results and methodologies to a wide audience and network at the same time. This year, posters are part of the national ACM Student Poster Research Competition (SRC). In Tampa, the posters will be on display for the entire conference, and highlighted in the posters reception on Monday. The best graduate and undergraduate posters will present their research in this special session.

Robotics Competition

10:30-11:30 a.m. Monday
Robotics Competition Preparation
International Ballroom South

6:00-9:00 p.m. Monday
Robotics Competition Posters
Grand Foyer

Robotics Competition teams will present posters coinciding with the ACM Student Poster Competition and Reception.

3:00-6:00 p.m. Tuesday
Robotics Competition, Supported by iRobot
Poinsettia and Quince Rooms

For the first time, the Tapia conference is hosting a robotics competition to test students' skills in building and programming robots to operate both in virtual and real-world environments. Five teams of university students took up the challenge and iRobot donated iRobot Create™ robots for each of the teams. The competition includes a series of activities that are part of the conference program. The robots for the Robotics Competition were provided by iRobot.

Banquet and Awards Ceremony

7:00-9:00 p.m. Tuesday
Palm Ballroom 2
Sponsored by Microsoft

At the celebratory banquet, good food and lively conversation will be followed by an invited talk by Maria Klawe and an awards ceremony. In addition to networking with a diverse group of students, faculty, researchers and practitioners from many areas, you will be able to socialize with a number of leaders in the field of computing in an informal setting. The evening will end with a DJ spinning music for dancing.

Student Poster Awards
The posters at the Tapia 2007 Conference are part of the national ACM Student Poster Research Competition (SRC). The first stage of the competition occurred prior to the conference: poster submissions were reviewed for relevance and importance of the problem before they were accepted. The Monday night poster presentations at the conference comprise the second stage of the competition. During this second stage, judges view the posters and talk with the entrants about their work. The third and final stage takes place Tuesday morning, when poster semi-finalists give oral presentations about their work. Based on the posters and the oral presentations, awards will be given for first, second, and third place, and these winners will advance to the ACM SRC Grand Finals, to be held online.

Robotics Competition Awards
The Robotics Competition is a first for this year's Tapia Conference. As part of this competition, teams from around the country were required to qualify for entry. Prior to coming to the conference, each team has programmed an iRobot CreateR robot to enable it to seek out objects in a rendered environment. During the competition on Tuesday, the robots will be required to locate objects in an environment created at the hotel expressly for this competition. The winner of the competition will be announced at the Tuesday Banquet and Awards Ceremony.

The Richard A. Tapia Achievement Awards for Scientific Scholarship, Civic Science and Diversifying Computing
A highlight of the evening will be the presentation of the "Richard A. Tapia Achievement Awards for Scientific Scholarship, Civic Science and Diversifying Computing." The award honors Richard Tapia's lifetime work as a "civic scientist" - a scientist who recognizes that people are at the very center of our highly complex technological and scientific world. Recipients are distinguished computational or computer scientists or computer engineers who are also making significant contributions to quality of life matters such as teaching, mentoring, advising, building and serving communities, or affecting local or national policy on human resource issues. Awardees will be recognized as those who demonstrate extraordinary leadership in increasing the participation of those groups who are underrepresented in the sciences.

Ken Kennedy Distinguished Lecture Honor
This year marks the establishment of the Ken Kennedy Distinguished Lecture, to be given at each Tapia Conference. The technical presentation will be in an area of computing and given by a world-class researcher who embraces Kennedy's research and outreach ideals. It recognizes the vast contributions of Ken Kennedy, a computing pioneer and one of the world's foremost experts on high-performance computing. Kennedy was a strong promoter of diversity and gender equity and founded Rice University's Department of Computer Science as well as several centers focused on computing. He passed away in February 2007.

Banquet Invited Presentation:
Mentoring across Race and Discipline

Maria Klawe, president of Harvey Mudd College in California and former dean of engineering and professor of computer science at Princeton University, will talk about how, as a female working at the boundary between mathematics and computer science, one of her life goals has been to increase the participation of women in science and engineering careers, especially in computer science and mathematics.

Conversation, Music, and Dancing

Finish the evening with great conversation, music and dancing. The Awards Banquet is sponsored by Microsoft.

Town Hall Meeting

12:15-1:30 p.m. Wednesday
Palm Ballroom 2

Your help is needed with the planning of future events and programs related to increasing diversity in the field of computing. Voice your ideas or suggestions during the Town Hall Meeting, which will provide an open forum for discussions about future Tapia events as well as possible programs that can be undertaken by the Coalition to Diversify Computing, a joint organization of the ACM, CRA and IEEE-CS, which is open to ideas for new projects that aid in increasing the diversity in the field of computing, especially within graduate programs in computing.

Your feedback is important!

Please fill out the survey!

During the conference, we will be surveying the participants to get your feedback on the appropriateness of the sessions, what you found most useful, and your suggestions for future Tapia Conferences. In addition, we would like to find out how the conference benefits you, and whether you intend to follow up with any of the speakers, panelists, committee members or others you have met while you were here. We cannot stress enough how important your feedback is - we want to be sure we continue to offer quality sessions that entice you to return again and again, to participate fully in future events, as well as enthusiastically encourage your colleagues to attend in 2009 and beyond.

Detailed Conference Schedule

Sunday, October 14

Registration Open 7:00 a.m.-7:00 p.m.

8:00 a.m.-5:30 p.m.
Doctoral Consortium
Gardenia and Fuchsia Rooms
(Note: Participation in the Doctoral Consortium is by invitation.)

Doctoral Consortium Co-Chair: Nina Berry, Sandia National Laboratories

Doctoral Consortium Co-Chair: Illya Hicks, Rice University

Doctoral Consortium Panelists: Earl Barnes, Georgia Institute of Technology; **Cherita Corbett,** Sandia National Laboratories, **Gilbert Rochon,** Purdue University

The Doctoral Consortium provides an opportunity for Ph.D. students to discuss and explore their research interests and career objectives with a panel of established researchers in computing and in computational mathematics, science and engineering. The objectives of the Doctoral Consortium are to:

- Provide a setting for feedback on participants' current research and guidance on future research directions
- Develop a supportive community of scholars and a spirit of collaborative research
- Provide a new generation of researchers and scientific leaders with advice and insight into academic, research, industrial and non-traditional career opportunities
- Contribute to the conference goals through interaction with other researchers and participation in conference events.

The Doctoral Consortium is supported by the National Science Foundation.

Nina Berry received a B.S. in Computer Science at Mary Washington College. She went on to receive a M.S. in Computer Science and a Ph.D. in Industrial and Manufacturing Engineering at Penn State. Berry is currently a Principal Member of Technical Staff at Sandia National Laboratories. She researches software entities known as intelligent agents. In recognition of her outstanding accomplishments, Berry has received a Women of Color Technology Award in Government and Defense for Educational Leadership in Government. Finally, she is the chair of the Coalition to Diversify Computing. nmberry@sandia.gov

Illya V. Hicks is an Associate Professor in the Computational and Applied Mathematics Department at Rice University. His research interests are in combinatorial optimization, integer programming, graph theory and matroid theory. Some applications of interest are social networks, cancer treatment and network design. His current research is focused on using graph decomposition techniques to solve NP-complete problems, and he teaches courses related to discrete optimization. Hicks has served as president of the Black Faculty Alliance at Texas A&M

University and president of the INFORMS Minority Issues Forum. He is also a member of both the SIAM and INFORMS Diversity committees. He earned his Ph.D. in Computational and Applied Mathematics from Rice University 2000, a master's in Computational and Applied Mathematics from Rice University and a B.S. in Mathematics from Southwest Texas State University. illya.hicks@caam.rice.edu

Doctoral Consortium Presentations

Use of Formal Computational Models for Designing Intelligent Mobile Device Interfaces
Maria Bonto-Kane
Computer Science, North Carolina State University
Advisor: Robert St. Amant

A Domain Specific Language for Numerical Optimization
Joseph G. Young
Computational and Applied Math, Rice University
Advisor: Yin Zhang

Developing a Model of Adaptation for Enactment: The Central Role of Adaptation in Teach Expertise and Curriculum Reuse
Huda Khan
Computer Science, University of Colorado at Boulder
Advisor: Tamara Sumner

Talking Games: Towards Speech as a Mainstream Modality
David Thornton
Computer Science and Software Engineering, Auburn University
Advisor: Juan Gilbert

Quantitative Risk Assessment Model for Software Security in the Design Phase of Software Development
Idongesit Mkpong-Ruffin
Computer Science and Software Engineering, Auburn University
Advisor: David Umphress

Secure Routing for Directional Optical Sensor Networks
Unoma Okorafor
Electrical and Computer Engineering, Texas A&M University
Advisor: Deepa Kundur

Researching Multimodal Augmented Reality Interfaces as a Viable Alternative to 2D and 3D Displays that Improves Task Orientation when Working with a Multitude of Robots
Ernest Cross
Computer Science and Software Engineering, Auburn University
Advisor: Juan Gilbert

An Issue of Privacy: Correlations between Users' Attitudes and Online Behaviors
Debbi Howard
School of Library and Information Science, University of North Texas
Advisor: Linda Schamber

6:00-6:30 p.m., Scholarship Orientation
6:30-8:00 p.m., Student Orientation
Student and Scholarship Recipient Orientation
Palm Ballroom 3

Scholarship Co-Chair: Maria Cristina Villalobos, University of Texas-Pan American
Scholarship Co-Chair: Pamela Williams, Sandia National Laboratories

At the Student and Scholarship Recipient Orientation, experience and suggestions will be offered to students toward maximizing the benefits of their participation in the Tapia 2007 conference and future professional activities.

Scholarship Recipient Orientation
Poster competition students as well as scholarship recipients are strongly encouraged to attend this session. Scholarship reimbursement procedures and conference participation expectations will be discussed. In addition, questions about submitting reimbursement requests and common mistakes made in the past will be addressed. Prevent reimbursement delays by attending this session.

Student Orientation
All students are invited to attend this pre-conference information session, which is aimed at helping students make the most of their conference experience. Students will be introduced to luminaries, leaders, and representatives from professional societies, academia, national laboratories, and industry. Students will also learn valuable networking skills that can be immediately put to use.

Maria Cristina Villalobos is an Associate Professor in the Department of Mathematics at the University of Texas-Pan American. Her research interests include linear and nonlinear optimization, applications of optimization, and mathematics education.

Dr. Villalobos earned her B.S. in Mathematics from the University of Texas-Austin and her M.S. and Ph.D. (2000) from Rice University in Computational and Applied Mathematics. Prior to arriving at UTPA, she was at St. Mary's University and the University of Texas-El Paso. Dr. Villalobos is actively involved in mentoring undergraduate students from underrepresented groups onto graduate school. She is a Ford Foundation predoctoral fellow. mcvilla@utpa.edu

Pamela J. Williams is a Senior Member of the Technical Staff in the Mathematics, Informatics, and Decision Sciences Department at Sandia National Laboratories. Her research interests include large-scale optimization, mathematical software design, data mining, and data fusion. Williams earned a B.S. in Mathematics from the University of Kentucky and her Ph.D. in Computational and Applied Mathematics from Rice University. Williams' honors and awards include an Otis A. Singletary

Scholarship, National Society of Black Engineers Fellow, AT&T Cooperative Research Fellowship, and Lawrence Livermore National Laboratory Education Outreach Award. She is a member of the Institute for Operations Research and Management Sciences and Phi Beta Kappa and is serving a three-year term on the University of Kentucky Alumni Association's Board of Directors. Finally, Williams is chair-elect of the Coalition to Diversify Computing. pwillia@sandia.gov

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8:00-10:00 p.m.
Opening Reception
Palm Ballroom 1 and 2

The Opening Reception offers a relaxed setting for the start of the conference, and Tapia 2007 General Chair Monica Martinez-Canales will welcome attendees at this informal get-together. This is an opportune time to meet and network with colleagues, leaders in the field, and potential future collaborators. Conference participants will have an opportunity to meet honoree Richard Tapia, a host of speakers and panelists, representatives from our sponsors and supporters, conference organizers and other conference participants.

The Tapia 2007 Opening Reception is sponsored by Google.

Monday, October 15

Registration Open 7:00 a.m.-5:00 p.m.

Pathways to Career Opportunities Exhibit Area Open 8:30 a.m.-5:30 p.m.

8:45-9:00 a.m.
Opening Remarks and Announcements
International Ballroom North and Center

Technical Program Co-Chair Ronald Metoyer, Oregon State University

Welcome to Conference Participants from the Office of U.S. Senator Bill Nelson

Plenary Session I
9:00-10:00 a.m.
International Ballroom North and Center

It's Not Just About the Machine!
Shirley Malcom
American Association for the Advancement of Science

Information is power. So the ability to create and manage information is empowering. When diversity is not reflected in a community that fuels a knowledge and information driven world, the skills to solve problems are not available to large segments of the population. It is now possible to draw congressional maps in ways that enfranchise or disenfranchise large populations of people. We have moved from paper to electronic voting. We can remotely monitor and document acts of genocide. We can create wealth and support meaningful work. We can invade or protect privacy. Given all the potential power in the hands of computing professionals, we must work to ensure that this capacity is reflected in a more diverse profession and that the power and responsibilities are incorporated into the way computer science is practiced.

Shirley Malcom is head of the Directorate for Education and Human Resources Programs of the American Association for the Advancement of Science (AAAS). The directorate includes AAAS programs in education, activities for underrepresented groups, and public understanding of science and technology. Malcom serves on several boards, including the Howard Heinz Endowment and the H. John Heinz III Center for Science, Economics and the Environment, and is an honorary trustee of the American Museum of Natural History. In 2006 she was named as co-chair (with Leon Lederman) of the National Science Board Commission on 21st Century Education in STEM. She serves as a regent of Morgan State University and as a trustee of Caltech.

In addition, she has chaired a number of national committees addressing education reform and access to scientific and technical education, careers and literacy. Malcom is a fellow of the AAAS and the American Academy of Arts and Sciences. She served on the National Science Board, the policymaking body of the National Science Foundation, from 1994 to 1998, and from 1994-2001 served on the President's Committee of Advisors on Science and Technology. In 2003 Dr. Malcom received the Public Welfare Medal of the National Academy of Sciences, the highest award given by the Academy. smalcom@aaas.org

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Break
10:00-10:30 a.m.
International Foyer
Sponsored by HP

Parallel Sessions
10:30 a.m.-12:15 p.m.

10:30-11:30 a.m.
Panel I: If Universities Care So Much about Diversity, Why Do Computing Departments Fail at Retaining Their Underrepresented Minority Students?
International Ballroom Center

Panelists: Roscoe Giles, Boston University; **Christopher Harris,** University of California, Irvine; **Richard Tapia,** Rice University; **Valerie Taylor,** Texas A&M University

This panel will discuss university retention practices across the country and how effectively they address the challenges of computing students. Discussion will follow where attendees will be encouraged to present their experiences and ideas about how both computing departments and universities could be more supportive. Some important questions that will be addressed by the panel include: Why do underrepresented minority students leave computing majors for other departments? Can departments leave retention efforts up to "Diversity Programs"? How do faculty members in computing disciplines view their role in retention? What could university administrators do to motivate departments and faculty members to work hard at retention? What kinds of academic support do computing students need? How important is community, and how can it be built? This panel is organized by a new NSF Broadening Participation in Computing Alliance entitled "Empowering Leadership: Computing Scholars of Tomorrow," (EL) Alliance (http://empoweringleadership.org).

Roscoe Giles is a professor in the Department of Electrical and Computer Engineering at Boston University (BU); the Deputy Director of the Center for Computational Science, BU; the Executive Director of the Institute for African American E-Culture; past Chair of the BU Faculty; and the Co-PI of the past NSF-funded collaboration, Engaging People in Cyberinfrastructure. For his work in increasing the participation of minorities in computer and computational science, in 2000 Giles received the A. Nico Habermann award from the CRA. His research focuses on the application of parallel and high performance computing (HPC) to physics and materials problems, and he has developed parallel algorithms for large-scale micromagnetic modeling and molecular dynamics simulation. He is committed to prototyping and building infrastructures that enable broad participation of scholars and students in HPC. Professor Giles received his Ph.D. in physics from Stanford University in 1975 and Bachelor of Arts in physics from the University of Chicago in 1970. roscoe@bu.edu

Christopher Harris received B.S. degrees in applied mathematics and computer engineering from Oakwood College and the University of Alabama in Huntsville, respectively, and the M.S. in electrical engineering from the University of Notre Dame. He has a passion for learning and has served as a tutor and mentor for more than 10 years for students from elementary school through college. Harris believes in knowledge as the great equalizer and is committed to helping increase educational opportunities for all people, with a special emphasis on underrepresented minorities in science, technology, engineering, and mathematics fields. He is pursuing a Ph.D. in electrical engineering and computer science at the University of California, Irvine where his research focuses on nanoelectronic computer architecture. Harris is a member of the IEEE, ACM, and the National Society of Black Engineers and hopes to one day become a university professor. Christopher.Harris@uci.edu.

Richard Tapia is a mathematician in the Department of Computational and Applied Mathematics at Rice University, where he holds the rank of University Professor and is also Maxfield-Oshman Professor in Engineering and Director of the Center for Excellence and Equity in Education. He received the B.A., M.A., and Ph.D. degrees in mathematics from the University of California-Los Angeles. Both of his parents came to the United States from Mexico when they were children, seeking educational opportunities. Tapia was the first Hispanic elected to the National Academy of Engineering; he was appointed to the National Science Board in 1996 by President Clinton, and he has received both the lifetime mentorship award of the American Association for the Advancement of Science and the National Science Foundation's Presidential Mentoring Award for Excellence in Science, Mathematics, and Engineering. Two national conferences carry his name: The Blackwell-Tapia Conference and the Tapia Celebration of Diversity in Computing. rtapia@rice.edu

Valerie E. Taylor earned her B.S. in electrical and computer engineering and M.S. in computer engineering from Purdue University in 1985 and 1986, respectively, and a Ph.D. in electrical engineering and computer science from the University of California, Berkeley, in 1991. Following 11 years on the faculty at Northwestern University, Taylor joined Texas A&M University as head of the Dwight Look College of Engineering's Department of Computer Science in January 2003, and also currently holds the Royce E. Wisenbaker Professorship II. Her research interests are in high performance computing, with emphasis on the performance of parallel and distributed applications and mesh partitioning for distributed systems, resulting in more than 90 papers. Taylor has received the 2002 IEEE Harriet B. Rigas Award for women with significant contributions in engineering education, the 2002 Outstanding Young Engineering Alumni from UC Berkeley, the 2002 Nico Habermann Award from CRA, and the 2005 Tapia Achievement Award for Scientific Scholarship, Civic Science, and Diversifying Computing. taylor@cs.tamu.edu

10:30-11:30 a.m.
Birds-of-a-Feather I: Robotics Competition Preparation
International Ballroom South

Organizers: Jeffrey Forbes, Duke University, and **Chad Jenkins,** Brown University

This BoF session is primarily an orientation for the Robotics Competition to be held Tuesday afternoon, but is open to all interested conference attendees. The competition, based on a class taught by Robotics Competition Co-Chair Chad Jenkins at

Brown University, involves programming a mobile robot to autonomously search for and visit a number of marked but unknown locations (or "survivors") in a given environment. Five teams representing four universities qualified for the competition.

Jeffrey Forbes is an assistant professor of the Practice of Computer Science at Duke University in Durham, North Carolina. His research interests include computer science education, intelligent agents and robotics. He received a B. S. in Computer Science from Stanford University and a Ph.D. in Computer Science from the University of California, Berkeley. Prof. Forbes holds memberships in the Association for Computing Machinery (ACM), American Association for Artificial Intelligence (AAAI), and the Coalition to Diversify Computing. forbes@cs.duke.edu

Odest Chadwicke Jenkins is an Assistant Professor of Computer Science at Brown University. His research group, Robotics, Learning and Autonomy at Brown (r,lab), explores topics related to human-robot interaction and robot learning. He is particularly interested in "bringing robots to the people," that is, finding ways for typical human users of technology to program (or teach) robots that behave according to their expectations. Toward this end, his research examines problems relating to robot learning from demonstration, robot perception of humans, dexterous manipulation, dimension reduction of robot experiences, and human-robot collaboration. Jenkins also dabbles in projects and courses in games technology research. Jenkins earned his bachelor's degree in Computer Science and Mathematics from Alma College, a master's in Computer Science from Georgia Institute of Technology, and his Ph.D. in Computer Science from the University of Southern California. cjenkins@cs.brown.edu

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10:30 a.m.-12:15 p.m.
Workshop I (part I): Undergraduate Research in Computing
International Ballroom North

Presenters and Contributors: Scott McCrickard, Virginia Tech, **Marlow Hinton, John Kelly** and **Michael Smith,** North Carolina A&T State University; **Clayton Lewis,** University of Colorado; **Maureen Biggers,** Georgia Tech; **Byong Lee,** Bennett College; George Harrison, Norfolk State University; Mahmoud Manzoul, Jackson State University; and Azubike Okpalaeze, Dillard University

This workshop will provide an opportunity for minority students, particularly those from minority-serving institutions, to present in a research environment and attend a conference. Submissions to the workshop came from undergraduate researchers, with a focus on attracting submissions from students taking part in summer programs like the National Science Foundation's Research Experiences for Undergraduates program. The workshop opening, presented by one or more of the organizers, will encourage and reinforce the opportunities that research can afford for its practitioners. The bulk of the workshop will be presentations by undergraduate researchers, with questions and advice from the workshop organizers and the students' peers. The closing social event will provide an opportunity for more informal exchange among participants and organizers.

Scott McCrickard is an Associate Professor in the Department of Computer Science and Center for Human-Computer Interaction at Virginia Tech. His research focuses on the design and development of notification systems for use in multi-tasking situations. Dr. McCrickard is director for a local NSF-sponsored Research Experiences for Undergraduates Site program, with four minority and women's colleges acting as partners. He is co-PI on an NSF Broadening Participation in Computing program led by North Carolina A&T State University to establish an alliance between minority and research universities for collaborative education and research, toward increasing Ph.D. production among underrepresented populations. He has worked with the NSF Advance program on online dissemination of materials related to the participation of women in science and engineering in graduate education. McCrickard received his B.S. degree from the University of North Carolina, Chapel Hill and his M.S. and Ph.D. degrees from the Georgia Institute of Technology. mccricks@cs.vt.edu

C. Marlow Hinton is the Director of Support Services in the Information Technology Division and is an Associate Professor in the Department of Computer Science in the College of Engineering at North Carolina A&T State University. He currently leads more than 35 technical professionals, including the university technical support staff, and an innovative student technical service team of over 50 students. He previously served as the Director of Research Computing where he implemented high performance and grid computing for multidisciplinary research. He has taught database systems, computer ethics and project management and has published papers in these respective areas. He has over 30 years experience in industry and academia and has been instrumental in creating the high performance computing center, the visualization laboratory, and the new Computational Science/Engineering master's degree program. Dr. Hinton holds degrees in Electrical Engineering and Computer Science and has published papers on grid computing, project management and multimedia software. mhinton@ncat.edu

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11:30 a.m.-12:15 p.m.
Panel II: Innovation in Broadening Participation in Computing: STARS Leadership Corps
International Ballroom Center

Panelists: Tiffany Barnes and **Teresa Dahlberg,** University of North Carolina at Charlotte

The STARS Leadership Corps (SLC) is an innovative program that integrates the research findings in effective practices for retention and recruiting of underrepresented minorities to make an impact in broadening participation in computing (BPC). The

SLC is a corps of college students across the STARS Alliance, a consortium of colleges and universities, whose core value is to become responsible leaders that use their computing skills to give back. By performing service, outreach, and research, SLC students learn that their computing skills are valuable to society and can be used to improve the quality of life, and take responsibility for sharing their skills with others. The SLC program builds community within and across STARS Alliance institutions; helps retain SLC students; recruits new students into computing; educates local K-12 teachers, counselors, students and parents about computing; and builds bridges with local industry and community organizations. The STARS Leadership Corps also provides an unprecedented opportunity to examine the differences in proven effective BPC practices for different students at very different institutions. Our panel will include both SLC students and faculty and will highlight projects and lessons learned in building partnerships and managing the SLC.

Tiffany Barnes is an Assistant Professor of Computer Science at the University of North Carolina at Charlotte, who specializes in educational data mining and using games to improve learning. Barnes is co-PI on the NSF-BPC funded STARS Alliance grant that engages college students in outreach, research, and service, and the NSF-BPC funded Culturally Situated Design Tools grant that teaches math and computing through online tools for discovering and creating cultural artifacts. She received her Ph.D. in Computer Science at North Carolina State University in 2003. She has been program Technical Director (1998-2006) for "Girls on Track," a summer program designed to increase girls' enthusiasm for and confidence in learning mathematics and using computer technology. Barnes is Director of the Game2Learn Research Lab at UNC Charlotte. The Game2Learn lab is currently developing and testing games to teach introductory programming, with the goal of broadening participation and increasing learning. tbarnes2@uncc.edu

Teresa Dahlberg is an Associate Professor of Computer Science at UNC Charlotte, who specializes in networking. Dahlberg is the main PI and Program Manager for the STARS Alliance. She also serves on the advisory board and as faculty mentor for the NSF grant entitled "GK-12 Fellowship Cooperative with Philip O. Berry Academy." In its second year, this Track 1 GK-12 Program Grant involves 10 science and technology UNC Charlotte graduate students working in a high-poverty, high-minority technology high school. As a subcontract for the NSF funded project "Girls are I.T." awarded to the Girl Scouts, Hornets' Nest Council of N.C. (http://www.girlsareit.org), she developed the Explorebots activity that resides in a mobile technology classroom that is traveling to Girl Scout troop meetings in western North Carolina. The technology teaches applications of robotics, sensors, networking and vision, while emphasizing the social context of the technology for planetary exploration (e.g., Mars Rover), exploring disaster sites, etc. tdahlber@uncc.edu

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Lunch Break
12:15-1:30 p.m.
On your own

Plenary Session II
1:30-2:30 p.m.
International Ballroom North and Center

Diversity: A Weapon of Mass Construction
Norman Johnson
Referentia Systems

How is it possible in 2007 that science and society have not come to a common understanding of the role of diversity in areas that deeply influence our lives - from ecologies to politics to the stock market? Socially we encourage diversity from at least an ethical (it's the right thing to do) viewpoint, if not from business argument. But then, our organizational actions emphasize the competitive origin of performance - "hire the best," "reward the achievers," "follow the strong" - all of which are fundamentally destructive to diversity. To resolve these conflicting views, we will take a journey of discovery that illustrates how the different roles of diversity in achieving higher performance are just different stages of development in complex systems or different roles of leadership in a complex society. We'll discover how we can solve the hardest problems with diverse collectives - but probably not following experts. And we'll see how our innate response to stress - following the herd (literally) - may be our worst enemy to innovative solutions in times of rapid change. Optimism for the future is found in the synergy of diversity - the ultimate weapon of mass construction.

Norman L. Johnson is currently Chief Scientist at Referentia Systems, a small, minority-owned business that develops advanced technology solutions to complex problems in the areas of defense and homeland security. He received his B.S. from the University of California, Davis, and his Ph.D. from the University of Wisconsin, Madison. Dr. Johnson is on leave of absence from Los Alamos National Laboratory, where he served for 25 years, most recently as Deputy Group Leader of the Theoretical Biology and Biophysics Group. Before this, he was Deputy Program Manager for three years for the Biological Threat Reduction Program Office and guided the development and execution of a $40 million program in all areas of biothreats, from genomics to sensor systems to system modeling to operations. As a project manager, he oversaw projects that were challenging and often considered to be in the "too hard to do" box. The key to success was enabling diverse teams to break limiting barriers and discover synergistic advantages of diverse contributions. His published research covers multiphase flows, inertial confined fusion, combustion modeling, self-organizing knowledge creation, diversity in collective systems, and developmental theories of evolution. His current areas of interest are biodefense, epidemiology - particularly pandemic influenza, science of diversity, and modeling the dynamics of social collectives and social identity. norman@santafe.edu

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Break
2:30-3:00 p.m.
International Foyer
Sponsored by HP

Parallel Sessions
3:00-5:30 p.m.

3:00-4:00 p.m.
Workshop I (part II): Undergraduate Research in Computing
International Ballroom North
See above description of Workshop I, page 12.

3:00-4:00 p.m.
Workshop II: What Do We Really Need to Do to Broaden Participation in Computing?
International Ballroom South

Presenter: Jan Cuny, National Science Foundation

The National Science Foundation's Broadening Participation in Computing (BPC) Program aims to increase engagement of the underrepresented groups in computing. Those groups - women, African Americans, Hispanics, Native Americans and Indigenous People, and persons with disabilities - have traditionally participated in computing in much smaller proportions than their representation in the population. This session explores the reasons for that underrepresentation and how those reasons are being addressed in BPC Demonstration Projects and Alliances. It also discusses where we go from here: Numerous efforts in the past have not been successful. What is different now? What more is needed? Who else needs to be involved? How can you participate?

Jan Cuny is the Program Director for the Broadening Participating in Computing (BPC) program at the National Science Foundation (NSF), and a professor at the University of Oregon (on leave to the NSF). Her research on programming environments for computational science currently focuses on support for model coupling in hydrological applications. She has a long-term involvement in efforts to increase the participation of women in computing research. She was a member of the Computing Research Association's Committee on the Status of Women, where she served at various times as co-chair, steering committee member, and a co-director of their Career Mentoring, Grad Cohort and Cohort for Associated Professors projects. Cuny has served on the advisory board for the Anita Borg Institute for Woman and Technology, the leadership team of the National Center for Women and Information Technology, and the executive board of the Coalition to Diversify Computing. She has also served as the Program Chair (2004) and General Chair (2006) of GHC. She is the co-chair of the 2007 Tapia/GHC Bridge Day. Cuny has been awarded the 2006 ACM President's Award and the 2007 CRA A. Nico Habermann Award for her work with underserved populations. jcuny@nsf.gov

3:00-5:30 p.m.
Workshop III: Planning and Executing Real Projects for Real Clients Courses
International Ballroom Center

Presenters: Vicki Almstrum, University of Texas at Austin; **Steven J. Condly**, University of Central Florida; **Allen Johnson**, Huston-Tillotson University; and **David Klappholz**, Stevens Institute of Technology

For computing graduates, many of whom will be employed in the IT world, many skills can be best learned, or even only learned, by working on real software for real clients as part of a team, for example by taking a Real Projects for Real Clients Course (RPRCC). Research has shown that the RPRCC experience in an undergraduate program can be effective in attracting and retaining minority students and women. RPRCCs are often offered as capstone courses, but can also be offered earlier in the undergraduate program, for example as database management systems and web programming courses. In fact, RPRCCs can be offered prior to the first computing course and as part of an RPRCC-centric curriculum that includes multiple RPRCCs. This workshop is part of a project to develop guidelines and materials to assist instructors as they develop and improve such courses. Participants will help refine a draft taxonomy of issues involved with teaching this type of course and share guidelines for developing such courses in terms of personal needs, institutional needs and resources.

Vicki Almstrum is a Research Associate at the University of Texas at Austin. She has served as treasurer for the ACM Special Interest Group on Computer Science Education (SIGCSE). In articles, panel discussions, working groups, websites and other activities, Dr. Almstrum is a strong proponent of elevating computing education research as a viable field. In 1998, she and Marian Petre founded the Doctoral Consortium at the annual SIGCSE Technical Symposium. She has eight years of industry experience with standards, methodologies and quality assurance for Motorola (in Tempe, Arizona) and Philips Elektronikindustrier (in Stockholm, Sweden). almstrum@cs.utexas.edu

Steven J. Condly is a Visiting Assistant Professor of Educational Psychology at the University of Central Florida. He specializes in the study of the relationship between motivation and cognition and their mutual influence on learning and achievement. He has developed graduate courses for UCF in motivation, adult learning and human intelligence. Current research projects include an examination of the effects of employee motivation on business outcomes in the hospitality industry, the creation of a concept inventory for students learning discrete mathematics, improving the training and testing of fire fighters, and analyzing factors critical to the successful adoption of software.

Allen Johnson, Jr. is Interim Chair of Computer Science at Huston-Tillotson University. He is chair of the Student and Academic Relations Committee of the Association of Software Testing and served on the advisory board for the UT Austin Software Engineering Institute's Software Project

Management certificate program. He has more than 25 years of experience teaching one-semester courses at the graduate/senior/junior level, teaching computer science college-level courses for IBM and other corporations, and 48-week industry courses that involved clients from not-for-profits and industry. Dr. Johnson has more than 35 years of experience developing computer systems and software in the industry.

David Klappholz is an Associate Professor of Computer Science at Stevens Institute of Technology. He has been teaching Computer Science for 33 years and has performed technology research under the sponsorship of, among others, NSF, IBM Research and the Department of Energy. His most recent interest is in pedagogic research, with an emphasis on the teaching of software development methods. He has co-taught Barry Boehm's RPRCC (USC CSCI577) and has spent the past five summers at USC helping improve the course's content and pedagogic style. david@cs.stevens.edu

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4:00-5:30 p.m.
Workshop IV: Are They Really Listening? Effective Presentations in Science Settings
International Ballroom South

Presenter: Tiffani Williams, Texas A&M University

The communication of ideas is an important element of working in the scientific community. In addition to writing research papers, scientists are expected to orally present their work in various settings (i.e., conferences, classrooms, funding agencies). Scientists work on very interesting problems. Yet, the beauty of their work is often inaccessible to an eager audience waiting to share the joy of understanding the solution to a challenging problem. The communication drift lies in the speaker not knowing (or caring) about the secret weapon of effective presentations: knowing your audience. Although this is a well-known general piece of advice for public speaking, it is rarely followed.

This workshop is intended to help participants (especially students) capture the attention of their audience for the duration of the presentation. The attendees will learn that they must forget their specialized knowledge in order to reach their audience. The workshop will present a number of additional techniques (i.e., presentation organization, designing visual aids, etc.) needed for a successful presentation. Attendees can expect to gain an arsenal of tools that can be used immediately in their next presentation. Effective scientific presentations have much in common with good technical writing. Where appropriate, the workshop will address the commonality of delivering good presentations and writing effectively.

Tiffani L. Williams is an Assistant Professor in the Department of Computer Science at Texas A&M University. She earned her B.S. in Computer Science from Marquette University and Ph.D. in Computer Science from the University of Central Florida. Afterward, she was a postdoctoral fellow at the University of New Mexico. Her honors include a Radcliffe Institute Fellowship, an Alfred P. Sloan Foundation Postdoctoral Fellowship and a McKnight Doctoral Fellowship. Her research interests are in the areas of bioinformatics and high-performance computing. tlw@cs.tamu.edu

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4:30-5:30 p.m.
Panel III: American Competitiveness Initiative
International Ballroom North

Moderator: Richard Tapia, Rice University. Presenters to be announced

The American Competitiveness Initiative Panel will address some of the challenges associated with maintaining U.S. competitiveness in a global economy. Leaders from computing industries, research institutions, government agencies and academia will discuss issues related to keeping the U.S. competitive, through creativity, innovation, research, education and non-traditional partnerships. Panelists will share their unique perspectives, reflect on global competition, and suggest implications for computing leaders of tomorrow.

Richard Tapia's biography appears on page 11.

Break
5:30-6:00 p.m.
On your own

6:00-9:00 p.m.
Student Poster Presentations
Grand Foyer

Poster Chair: Charles Koelbel, Rice University

The Tapia 2007 poster session is an opportunity for students to present their latest research results and methodologies to a wide conference audience and to network at the same time. This year, the posters competition is part of the ACM Student Research Competition (SRC). For the Monday night poster session, each author of an accepted poster will be assigned a space to display a printed research poster. These posters will remain up for the duration of the conference. On Monday evening, authors will present their posters in a reception attended by conference attendees and judges. The judges will have the opportunity to view the posters and talk to entrants about their work. The judges will then select the top five posters in the graduate and undergraduate categories as semi-finalists to advance to the third stage.

Authors of the top five undergraduate and graduate posters, as decided by judges during the Monday night poster session, will each give a 10-minute oral presentation of their work during a special session Tuesday morning. From these semi-finalists, the top three posters in the graduate and undergraduate student categories will be chosen and entered into the ACM Grand Finals for the Student Research Competition to be held online.

Poster abstracts begin on page 24.

Charles Koelbel is a Research Scientist at Rice University, where he works on various projects involving Grid computing, parallel languages, and supercomputing. Most of his current work is devoted to the Virtual Grid Applications Development Software (VGrADS) project, featured in a Tapia 2005 Conference panel. He is perhaps better known, however, for his work defining High Performance Fortran in the early 1990s. He has been at Rice since 1990, except for 1998-2001 when he was a Program Director at NSF, with responsibilities for the Advanced Computational Research and Information Technology Research programs. He received his PhD in Computer Science from Purdue University in 1990. chk@cs.rice.edu

Tuesday, October 16

Registration Open 7:00 a.m.-5:00 p.m.

Pathways to Career Opportunities Exhibit Area Open 8:30 a.m.-5:30 p.m.

8:45-9:00 a.m.
Opening Remarks and Announcements
International Ballroom North and Center

Technical Program Co-Chair Tiffani Williams

Plenary Session III
9:00-10:00 a.m.
International Ballroom North and Center

kuhl-er-blahynd
John Leslie King
University of Michigan

Fewer than 50 percent of English words are spelled phonetically. Yet, some people are adamant that phonics is the only way to learn to read English. Ideology often trumps fact, and this shows up clearly with regard to racial and ethnic diversity. In the past two decades, U.S. discourse on race relations has made a curious shift, from acute color-awareness to a recent claim that everything will be solved if American society simply becomes "colorblind." Even if that was possible, would it be desirable? This talk uses the ideology of colorblindness to explore various ways people can be blind to facts.

John Leslie King is the University of Michigan's vice provost for academic information and a professor in the School of Information. In June 2007, he was appointed to a three-year term on the Council for the Computing Community Consortium. The consortium was established by the Computing Research Association (CRA) under a $6 million, three-year agreement with the National Science Foundation to identify major research opportunities and establish "grand challenges" for the computing field. Previously, he was professor of information and computer science and management and a research scientist in the Center for Research on Information Technology and Organizations at the University of California, Irvine. In 2005, King received a fellowship as Fulbright Distinguished Chair in American Studies at Germany's Johann Wolfgang Goethe University (University of Frankfurt) for the spring term. Also in 2005, King was named a fellow of the Association for Information Systems for his contributions to research, teaching, and service in the global information systems community. For the past several years, King has also been a senior scientific advisor on cyberinfrastructure for the National Science Foundation. He is also a member of the NSF advisory committees for computing and information science and engineering, as well as the social, behavioral, and economic sciences. jlking@umich.edu

Break
10:00-10:30 a.m.
On your own

Parallel Sessions
10:30 a.m.-12:15 p.m.

10:30 a.m.-12:15 p.m.
ACM Student Poster Presentations
International Ballroom North

Poster Chair: Charles Koelbel, Rice University

Authors of the top five undergraduate and graduate posters, as decided by judges during the Monday night poster session, will each give a 10-minute oral presentation of their work. From these semi-finalists, the top three posters in the graduate and undergraduate student categories will be chosen. They will also be entered into the ACM Grand Finals for the Student Research Competition to be held online.

Charles Koelbel's biography appears top left.

10:30-11:15 a.m.
Panel IV: Evolving Careers in Computational Science
International Ballroom South

Presenters: Kelley Herndon Ford, Marisol Gamboa, Juan Hernandez, Katie Lewis, and **Celeste Matarazzo,** Lawrence Livermore National Laboratory

A diverse group of computer scientists from Lawrence Livermore National Laboratory (LLNL) share their career experiences, including what piqued their interest in computing and how they have struck a balance between family and career. LLNL panelists include both management and scientific staff from the Computing Applications and Research Department, with Celeste Matarazzo serving as the moderator. Audience members are encouraged to engage the panelists with questions and comments.

Kelley Herndon Ford earned a B.S. in Chemistry in 1997 from Stanford University. Following her undergraduate studies, Kelley worked in the biotechnology field for 2.5 years as an analytical chemist at Chiron Corporation before returning to Stanford and earning an M.S. in Computer Science in 2005. She was also active in the school's Women in Computer Science and Women in Engineering organizations. More than six years ago, Ford began working at LLNL, where she developed user interfaces for the National Ignition Facility's distributed control system. She became the administrative group leader for the user interfaces group in 2005, and in January 2007, she transferred internally to support homeland security efforts. She is married, has a 14-month-old son, and is an avid cyclist. hernd onford1@llnl.gov

Marisol Gamboa earned a B.S. in Computer Science in 1998 from the University of New Mexico. Upon graduation, she worked as a software engineer at the IBM Almaden Research Center. Gamboa joined LLNL in 2002 on assignment to the National Ignition Facility, where she developed distributed control system user interfaces. She is currently a senior computer scientist and technical lead for Nonproliferation, Homeland, and International Security in the Counterproliferation Analysis Section. She is responsible for the design and implementation of software capable of supporting the rapid integration of analytical technologies for processing unstructured messages in a high-performance computer environment. Gamboa is a single mother of a 12-year-old daughter and enjoys spending her time off with family and friends. gamboa2@llnl.gov

Juan Hernandez is an American Society of Quality Certified Software Quality Engineer at Lawrence Livermore National Laboratory. Hernandez has over 17 years in the software quality assurance (SQA) area having worked both as an SQA engineer and as SQA manager in private industry. He has been at LLNL six years and now works as a computer scientist in support of one of the simulation programs running on supercomputers. Hernandez has extensive experience in software testing and software configuration management. He earned his B.S. in Applied Mathematics from the University of California at Santa Barbara and a master's in Business Administration from National University. Juan served for seven years in the U.S. Army where he reached the rank of first lieutenant in the Signal Corps. hernandez43@llnl.gov

Katie Lewis earned a B.S. in Mathematics, with a minor in Computer Science, from the University of San Francisco in 1998. Upon graduation, she began working as a mathematical programmer at LLNL. Today, she is a deputy project leader and an administrative supervisor. Although Lewis attended high school on a Clare Boothe Luce scholarship for women who excel in math and science, it wasn't until she entered a computer science program in college that she noticed a lack of women in these fields. Lewis was often the only female student in her upper-division computer science classes, and that trend continued into her career at LLNL. Luckily, she interacts with more female computer scientists as she broadens her network at LLNL. Lewis is married with a two-year-old son and two dogs, and she enjoys traveling, hiking, snowboarding, and wakeboarding. lewis66@llnl.gov

Celeste Matarazzo is a data science expert with more than 20 years of service in LLNL's Computation Directorate. She is currently a division leader who provides oversight and technical leadership for approximately 100 computer scientists and technicians. Matarazzo was previously the project leader for the Advanced Simulation and Computing Program's Scientific Data Management effort. She also served as a Computation ombudsperson for seven years and is a past president of the LLNL Women's Association. She is a member of both ACM and IEEE and supports community outreach efforts to promote math and science. Matarazzo has a B.S. in Mathematics and Computer Science from Adelphi University and pursued her graduate studies at the University of Wisconsin-Madison. She is an avid cyclist who achieved a longtime goal in 2005 when she completed a 3,850-mile transcontinental bicycle journey from San Francisco to Virginia Beach. She is married with an active 18-month-old Labrador retriever. matarazzo1@llnl.gov

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11:15 a.m.-12:15 p.m.
BOF II: A Change for the Better: Help Create Recommendations for Computing Departments to Retain Students
International Ballroom South

Discussion leaders: Raquell Holmes, Boston University; **Cynthia Lanius,** Consultant; **Phoebe Lenear,** University of Illinois; **Ann Redelfs,** Redelfs LLC; **Richard Tapia,** Rice University

How should computing departments adapt their departmental climate to make it more welcoming to all? What kinds of academic support are needed by computing students? How can a community with critical mass be built in departments with so few minority students? How important are faculty-student interactions, and how can they be improved? Share experiences and suggestions on these and more questions about retention in computing that will be included in a report to be disseminated to universities. This BOF is organized by a new NSF Broadening Participation in Computing Alliance entitled "Empowering Leadership: Computing Scholars of Tomorrow," (EL) Alliance. The EL Alliance engages underrepresented minority computing students at research institutions in a nationwide network to generate excitement and maintain motivation as they pursue computing careers. Information gathered from the BOF will be used by the EL Alliance to inform its practices. For more information see http://empoweringleadership.org.

Raquell M. Holmes received her Ph.D. from the Cell, Molecular, and Developmental Biology program at Tufts University in Boston, Mass. After completing her postdoctoral studies at the Dana Farber Cancer Institute, she joined the Center for Computational Science at Boston University as program manager for

the Education Outreach and Training Partnership for Advanced Computational Infrastructure (EOT-PACI) program. Holmes' post-modern approach to building community and social learning environments supports people from diverse academic and cultural backgrounds to become creators and users of innovative technologies. Her current efforts as assistant professor at the University of Connecticut Health Center focus on training future quantitative and computational cell biologists. raquell@bu.edu

Cynthia Lanius is co-program manager, along with Ann Redelfs, of the Empowering Leadership: Computing Scholars of Tomorrow (EL) Alliance. Lanius is a former high school mathematics teacher, leaving teaching to co-found, along with Richard Tapia, the Center for Excellence and Equity in Education at Rice University. Cynthia also served on the Leadership Teams of the Education, Outreach and Training Partnership for Advanced Computational Infrastructure (EOT-PACI) and the Engaging People in Cyber-infrastructure (EPIC) projects. Following that, she designed and implemented new math education programs as Associate Director of the Math Forum at Drexel University. clanius@bellsouth.net

Phoebe Lenear has more than 15 years of experience in the workplace as a program manager, systems developer, and a coordinator of testing, training, and integration projects. Her positions in academia and the research sector have required extensive communication, collaboration and technical skills. She has consulted with military personnel to integrate voice technology into their work environments, helped software vendors define their user requirements and meet contract specifications, and conducted and facilitated training for military personnel and university faculty and staff. Lenear holds bachelor of science and master of science degrees in general engineering (mathematics and human-computer interaction), and a Ph.D. degree in human resource education (technology education) from the University of Illinois at Urbana-Champaign. She currently serves as the coordinator of instructor services at the University of Illinois Global Campus. lenear3@uillinois.edu

Ann Redelfs' tenure within the computing community has included positions at the Cornell Theory Center, Center for Research on Parallel Computation (Rice University), and the San Diego Supercomputer Center (SDSC). She has directed both external relations and education/outreach programs, and founded and co-chaired SDSC's first Diversity Committee. She was on the founding committee for the Richard Tapia Celebration of Diversity in Computing, and served on the SC conference, GridToday Summits, and Grace Hopper Celebration committees over the past 20 years. Redelfs has been active with the Coalition to Diversify Computing, Anita Borg Institute for Women and Technology and the CRA's Committee on the Status of Women in Computing Research. She served on the Leadership Teams for the Education, Outreach, and Training-Partnership for Advanced Computational Infrastructure and the Engaging People in Cyberinfrastructure projects, and is currently co-program manager, along with Cynthia Lanius, of the Empowering Leadership: Computing Scholars of Tomorrow Alliance. ann@redelfs.us

Richard Tapia's biography appears on page 11.

10:30 a.m.-12:15 p.m.
Workshop V: Google Resume Workshop: An Ingredient for Success
International Ballroom Center

Presenters: M. Brian Blake, Georgetown University, **Joel Branch,** IBM Research, and **Edward Taylor,** Google.

You have the education, you have the skills, but how do you make sure your resume gets noticed among all the others? In this workshop, learn from experts from academia and leading companies about the best ways to get your foot in the door, land an interview and join the organization of your choice.

M. Brian Blake is the Department Chair and the Director of Graduate Studies in Department of Computer Science at Georgetown University. Dr. Blake conducts applied research in the development of intelligent agent approaches for the sharing of information and capabilities across organizational boundaries. With respect to this area of interest, his investigations cover the spectrum of software engineering: design, specification, and proof of correctness, implementation, experimentation, performance evaluation, and application. He has published over 80 journal articles and refereed conference papers in the areas of intelligent agents and workflow, service-oriented computing, component-based software engineering, distributed data management, and software engineering education. He is the recipient of several best paper awards and was selected the Most Promising Engineer by the Career Communications Group in 2003. He received a bachelor's degree in Electrical Engineering from Georgia Institute of Technology and has a Ph.D. in Information and Software Engineering from George Mason University, Fairfax, Virginia. Dr. Blake serves as the funding chair for Tapia2007. mb7@georgetown.edu

Joel Branch received his Ph.D. in Computer Science from Rensselaer Polytechnic Institute (RPI) in 2007, where he also received the Robert McNaughton Award for outstanding thesis research. He also received his M.S. from RPI in 2003 and his B.S. in Systems and Computer Science from Howard University in 2001. Dr. Branch's research interests are in pervasive sensor and actuator networks as well as network management. Dr. Branch is currently a research staff member in the Network Management Research Department at the IBM T.J. Watson Research Center in Hawthorne, NY.

Edward Taylor joined Google Engineering in October 2004 to focus on testing and quality issues across Google's software properties. Taylor's present responsibilities include testing of the Ads and Commerce system and Infrastructure. He has more than 20 years of experience in the software industry, most which was spent with IBM's Santa Teresa Lab (now called Silicon Valley Lab) where he held various technical and management positions in the Data Base organization, primarily on DB2. While with IBM, Taylor was also responsible for developing and delivering such diverse software products as (a first of its kind) SGML Document formatter for the publishing industry and an architecture and products for the definition and implementation of Information Warehouses. Taylor has also served as director of quality for Verity Software, a leading enterprise search software company, and director of engineering services for Legato Systems, a leader in storage management products.

12:15-1:30 p.m.
Lunch/Plenary Talk: Appreciating Mathematical Computation through Applications to Very Cool Activities
Palm Ballroom 2

Presenters: Richard Tapia, Edward Gonzalez, and **Josef Sifuentes,** Rice University

Throughout his life Richard Tapia has been involved in competitive bicycle and car activities. In this presentation, composed of video segments with narration, he and his co-presenters share several experiences in which his mathematical training assisted him in appreciating, identifying, understanding, or solving a problem he encountered racing bikes or displaying a show car. Rice Ph.D. student Edward Gonzalez demonstrates how he used discrete optimization computation to solve the problem of assigning lanes fairly in bicycle motocross (BMX) racing. Josef Sifuentes, also a Rice Ph.D. student, describes how he used computation to make a psychedelic video to accompany the showing of the award-winning Tapia '70 Chevelle Heavy Metal at car shows across the country. The images were created using the nation's largest supercomputer to perform numerical simulations of the Navier-Stokes partial differential equations that govern fluid flow in and around the car in the video. This presentation has been given to thousands of people across the country that initially believed that computational mathematics had nothing to do with their world.

Edward Gonzalez was born and raised in Pico Rivera, California, a city located in southeastern Los Angeles County, where his love for mathematics was cultivated through the enthusiastic instruction of his math teachers at St. Paul High School, located in nearby Santa Fe Springs, California. Gonzalez went on to attend the University of California, Berkeley, where he majored in both applied mathematics and economics. Currently he is attending graduate school at Rice University where he is a Ph.D. candidate in the department of Computational and Applied Mathematics. His research is focused on evaluating the Non-negative Matrix Factorization problem, where his two primary areas of interest are in algorithm development and property discovery. efg@caampc42.caam.rice.edu

Josef Sifuentes was born and raised in the East End of Houston, Texas. He is a product of Houston's public schools and has continued his education at Rice University, where he completed his Bachelors degree in Mathematics, Computational and Applied Mathematics, and Visual Art. He is currently a National Science Foundation Graduate Research Fellow at Rice in the Computational and Applied Mathematics Department. His research interests are in numerical methods for simulating wave scattering and numerical partial differential equations. He continues to work as an artist in his community on mural projects with his father, who is also an artist. josefs@caam.rice.edu

Richard Tapia's biography appears on page 11.

Plenary Session IV: Ken Kennedy Distinguished Lecture
1:30-2:30 p.m.
International Ballroom North and Center

Multi-Robot Intelligence
Manuela Veloso
Carnegie Mellon University

This presentation will show how robots are physical artifacts with a seamless integration of perception, cognition and action. The presentation will be focused on teams of intelligent autonomous robots performing tasks in highly uncertain domains. Robots need to jointly assess the state of their environment, communicate with each other, make decisions, execute actions towards the achievement of team objectives, and learn from observation and feedback based on the outcome of their actions.

Manuela M. Veloso is the Herbert A. Simon Professor of Computer Science at Carnegie Mellon University. She earned her Ph.D. in Computer Science from Carnegie Mellon. She also received a B.S. in Electrical Engineering in 1980 and a M.Sc. in Electrical and Computer Engineering in 1984 from the Instituto Superior Tecnico in Lisbon. Veloso researches in planning, control learning, and execution for multirobot teams. Her algorithms address uncertain, dynamic, and adversarial environments. With her students, Veloso has developed teams of robot soccer agents, which have been RoboCup world champions several times. Veloso is a Fellow of the American Association of Artificial Intelligence and President-Elect 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. Veloso was Program Chair of the 2007 International Joint Conference on Artificial Intelligence, IJCAI'07, held in Hyderabad. Veloso is the author of one book on "Planning by Analogical Reasoning" and editor of several other books. She is also an author in more than 200 journal articles and conference papers. veloso@cs.cmu.edu

Break
2:30-3:00 p.m.
On your own

Parallel Sessions
3:00-6:00 p.m.

3:00-4:30 p.m.
Technical Papers Session I
International Ballroom North

Engaging Passion for Computing: Using Virtual Gaming Environments to Motivate Girls to Follow IT Career Paths
Andrea Tapia, Magy Seif El-Nasr, Ibrahim Yucel, Joseph Zupko, and Edgar Maldonado, Penn State University

The percentage of young women choosing educational paths leading to science and technology-based employment has been

dropping for several years. In our view, the core cause for this phenomenon is a lack of interest and social support on the part of the girls and their families, and not a lack of ability. The specific aim of this paper is to evaluate the utility of building virtual environments in influencing girls' interest in computer-related educational paths and careers. This is evaluated through an intervention, or action-research, in the form of a class named "Gaming for Girls." This class was offered to middle and high school girls three times over the years 2005-2006. We assert playing and developing computer games can lead to the acquisition of tangible IT skills and a higher sense of self-efficacy in terms of computer use. In particular, we discuss intervention methods that aim at changing socialization patterns by bringing girls into an all-girl classroom, reducing game violence by altering the forms of game action, and removing potentially negative character designs by allowing girls to design characters and game interaction themselves. We assert that within the information economy, playing video games is an advantage.

A Model for Guiding Undergraduates to Success in Computational Science

Amos Olagunju, St. Cloud State University; **Paul Fisher** and **John Adeyeye,** Winston Salem State University

This paper presents a model for guiding undergraduates to success in computational science. A set of integrated, interdisciplinary training and research activities is outlined for use as a vehicle to increase and produce graduates with research experiences in computational and mathematical sciences. The model is responsive to the development of new interdisciplinary curricula in computational biology, chemistry, mathematics and physics.

An Architecture for a Collaborative Bibliographic Database

Beth Trushkowsky, Kamaria Campbell, and **Jeffrey Forbes,** Duke University

The goal of CoBib is to allow affinity groups to effectively collaborate to maximize the searching and browsing utility of an academic paper database. The CoBib system will facilitate the process of surveying literature in a specific field by using the community's annotations and referrals. The database architecture for CoBib provides users within research communities the means to collaboratively index and annotate citations. This extensible architecture is a novel solution that is interoperable with existing data formats and systems and incorporates recommendations gathered from the community for the discovery of new citations.

4:30-5:30 p.m.

BOF III: Evaluating Diversity Initiatives to Broadening Participation in Computing

International Ballroom North

Discussion leaders: Tiffany Barnes and **Teresa Dahlberg,** University of North Carolina at Charlotte

The Broadening Participation in Computing (BPC) program at the National Science Foundation funds projects to include a larger and more diverse population in the field of computing. Efforts in this area range from undergraduate research experiences to K-12 summer camps to bridging programs that prepare students for success. However, to achieve success on a national scale, we must determine just what contributes to success in BPC. However, evaluating BPC programs poses difficult challenges, including obtaining IRB approval, experimental design (controlled studies are nearly impossible), tracking students in diverse educational institutions, determining what to measure when, etc. Of additional concern is that computing faculty from underrepresented populations are often the ones running BPC programs, which may not contribute to computing career advancement. This BoF will engage computing faculty to discuss the important issues in BPC evaluation, and to identify ways to ensure continued career success while engaging in these very important BPC efforts.

Biographies of **Tiffany Barnes** and **Teresa Dahlberg** appear on page 13.

3:00-6:00 p.m.

Robotics Competition

Poinsettia and Quince Rooms

Robotics Competition Co-Chairs: Jeffrey Forbes, Duke University, and **Chad Jenkins,** Brown University

The two-stage Robotics Competition involves simulated and physical disaster environments where the goal is to identify and locate a number of different objects. In the first stage held prior to the conference, teams used Player software to program a virtual robot to seek out objects in a Gazebo-rendered environment. This three-hour session is the second stage, during which each team will field its iRobot Create® robot equipped with a camera and touch sensors to locate objects in an environment created at the conference hotel. The iRobot Create® programmable robots were donated by iRobot®.

Qualifying Teams

BamBotics
University of Alabama: **Rachel Bystricky, Shameka Dawson, Quinton Alexander,** and **Heather Freeman**
Faculty advisor: **Monica Anderson**

HMC Escher
Harvey Mudd College: **Vedika Khemani, Jessica Wen,** and **Rachel Arce-Jaeger**
Faculty advisor: **Zach Dodds**

Nexus 6
Simon Fraser University: **Angelica Lim, Angelina Fabbro, Kate Tsoukalas,** and **Lorin Beer.**
Faculty advisor: **Richard Vaughan**

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Simon Fraser University: **Santi Santi, Adi Himawan, Agus Santoso,** and **Nhan Nguyen**
Faculty advisor: **Richard Vaughan**

Team Tora
Auburn University: **E. Vincent Cross II, Christin Hamilton, Jerome McClendon,** and **Caio Soares**
Faculty advisor: **Shaun Gittens**

Jeffrey Forbes and **Chad Jenkins'** biographies appear on page 12.

Break
6:00-7:00 p.m.
On your own

VIP Reception (by invitation)
6:00-7:00 p.m.
Camellia and Dogwood Rooms

7:00-9:00 p.m.
Banquet Awards Ceremony and Banquet Address
Palm Ballroom 2

Dinner
Presentation of **Best Poster Awards, Robotics Award, Richard Tapia Achievement Awards,** and **Ken Kennedy Distinguished Lecture Honor**

Banquet Address
Mentoring across Race and Discipline
Maria Klawe
Harvey Mudd College

As a female working at the boundary between mathematics and computer science, one of my life goals has been to increase the participation of women in science and engineering careers, especially in computer science and mathematics. Moving to the U.S. from Canada four and half years ago has given me the opportunity to become much more involved in mentoring minority students, some of whom have been working in areas I know little about. This talk explores some of the challenges and successes I have found in trying to translate approaches from mentoring women in my own field to mentoring students of color in many fields."

Maria Klawe became the fifth president of Harvey Mudd College on July 1, 2006. Prior to joining HMC, she served as dean of engineering and professor of computer science at Princeton University. During her time at Princeton, she led the School of Engineering and Applied Science through a strategic planning exercise that created an exciting and widely embraced vision for the school. At Harvey Mudd College, she is leading a similarly ambitious strategic planning initiative known as "HMC 2020: Envisioning the Future." Klawe joined Princeton from the University of British Columbia where she served as dean of science from 1998 to 2002, vice president of student and academic services from 1995 to 1998 and head of the Department of Computer Science from 1988 to 1995. Prior to UBC, Klawe spent eight years with IBM Research in California, and two years at the University of Toronto. She received her Ph.D. (1977) and B.Sc. (1973) in Mathematics from the University of Alberta.

Klawe has made significant research contributions in several areas of mathematics and computer science including functional analysis, discrete mathematics, theoretical computer science, human-computer interaction, gender issues in information technology, and interactive-multimedia for mathematics education. Her current research focuses on the development and use of multi-modal applications to assist people with aphasia and other cognitive impairments.

She has held leadership positions with the Association of Computing Machinery, the Anita Borg Institute for Women and Technology, the American Mathematical Society, the Computing Research Association, the Society for Industrial and Applied Mathematics, and the Canadian Mathematical Society. Maria was elected as a fellow of the Association of Computing Machinery in 1995 and as a founding fellow of the Canadian Information Processing Society in 2006. Maria_Klawe@HMC.Edu

The Banquet will be followed by music and dancing until 11:00 p.m.

Wednesday, October 17

Registration Open 7:00-9:00 a.m.

8:45 a.m.-5:30 p.m.
Bridge Day Activities

With the co-location of the Richard Tapia Celebration of Diversity in Computing and the Grace Hopper Celebration of Women and Computing conferences this week in Orlando, a day of special activities was created to help bridge the two meetings. Some of the Bridge Day activities, such as the Plenary Talk by Anne Kuhns, are open to all attendees, while others are open only to the 100 students awarded scholarships to participate specifically in Bridge Day. Bridge Day is co-hosted by the Coalition to Diversify Computing and the Anita Borg Institute for Women and Technology and has been underwritten by Microsoft, the Disney Corporation, and through a grant from the National Science Foundation (NSF).

8:45-9:00 a.m.
Opening Remarks
International Ballroom North and Center

ACM President Stuart Feldman

Plenary Session V
9:00-10:00 a.m.
International Ballroom North and Center

Diversity Is the Key to IT Security at Disney
Anne Kuhns
Walt Disney Parks and Resorts, LLC

As a global business, the world of Disney has a 75-year history of success in making magical fantasy seem real, whether in film or in our theme parks on three continents. But one thing that is very real is the challenge of protecting the personal information of our millions of visitors and tens of thousands of employees. Achieving this goal requires a diverse and extremely talented team with both expertise and creativity. This approach mirrors that of our larger organization - Disney's brand, which includes our people, our products and the overall experience is the result of a commitment to diversity. At Disney, diversity is a way of thinking, a way of doing business and a way of life. In this talk, I'll describe how we used that approach to protecting IT security.

Anne Kuhns is the Director of IT Security for Walt Disney Parks and Resorts. Her responsibilities include information security, privacy, business continuity strategy, and IT risk management for Disney Parks and Resorts IT worldwide. In her 31-year career with Disney IT, she has held a variety of roles including application development, technical support, project management, strategy development and information security and risk management. Her team has delivered a variety of information security infrastructure solutions, incorporated information security into the WDP&R IT project management methodology, and developed an information security awareness program that has been adopted across other business units within The Walt Disney Company. Kuhns was recognized as the Information Security Executive of the Year - Southeast 2007 by the Executive Alliance. She is a member of the Computer Security Institute and is serving a second consecutive term as chairperson for the CSI Advisory Council, and she is a member of ISACA. A Florida native, Kuhns earned her bachelor's and master's degrees from the University of Florida. In her spare time, she likes to travel, read, or do anything close to or on the ocean. anne.kuhns@disney.com

Break
10:00-10:30 a.m.
On your own

Parallel Sessions
10:30 a.m.-12:15 p.m.

10:30 a.m.-12:00 p.m.
Workshop VI: Preparation of High School Students for Technical Conferences
International Ballroom South

Presenter: Jesse Bemley, Joint Educational Facilities

Joint Educational Facilities, Inc. (JEF) is a minority nonprofit, community-based organization with a 501c3 status that has been in existence for almost 25 years. With a primary focus on middle and senior high school students in the inner city it has been successful in introducing advanced computing topics to them. JEF currently provides classes at grade levels 4-12 on Saturdays during the academic year, as well as during the summer months, resulting in year-round learning opportunities. JEF is proud of the fact that its students have learned how to do research, complete projects, and prepare award-winning presentations at national and international computing and engineering conferences. Many of JEF students have been accepted at universities and colleges where they have earned undergraduate and graduate degrees in computer science and related fields.

Jesse Bemley founded Joint Educational Facilities in 1984. He began his career in mentoring youth at that time. He has served as a high school mathematics teacher at Magnolia High School in Moss Point, Mississippi; a cartographer at the U.S. Air Force Aeronautical Chart and Information Center in St. Louis, Missouri; a mathematician at the U.S. Army Map Service; a computer specialist for the Drug Enforcement Administration, District of Columbia Board of Elections, and the U.S. Army Cost Center; and an IT specialist in the U.S. Army National Guard. Bemley has served as an adjunct professor at Strayer University, Southeastern University, the University of the District of Columbia, The American University, and George Washington University. He has published extensively in the area of training pre-college students in advanced computing and contemporary mathematics. His students have published more than 300 papers over the last decade. Bemley received his bachelor's degree in mathematics (*suma cum laude*) from Mississippi Valley State University, his master's degree in computing from American University and his doctorate in Public Administration from Pacific Western University. In April 2005, he was inducted into the D.C. Hall of Fame for his mentoring work in the community. jbemley@jef.org

10:30-11:15 a.m.
Panel V: Engaging Communities through Cyberinfrastructure: Lessons from the National Science Digital Library
International Ballroom North

Presenters: Eileen McIlvain, National Science Digital Library, and **Manuel Perez-Quinones,** Virginia Polytechnic Institute and State University

21st Century information technologies have broken down long-standing barriers of access and geography that previously defined how people communicate, participate and collaborate in academic and research environments. In the wake of these advancements it becomes clear that context and community are more important than ever if we are to truly change the social fabric of the sciences - access alone is insufficient. Presenters will share lessons learned from the National Science Digital Library (NSDL), an NSF-funded effort supporting science, technology, engineering and mathematics (STEM) education at all levels. NSDL was founded with a traditional library mission to organize information about STEM resources and facilitate online access to these materials. In order to best serve the needs of educators and learners, NSDL quickly realized it must expand beyond library functions to support and sustain the creation of both community and context. As a result, NSDL is leveraging collaborations among a variety of education stakeholders and harnessing the technical aspects of the

cyberinfrastructure it has built to empower communities, and community-driven enhancements in STEM teaching and learning. Discussions will feature examples from NSDL partners in a range of disciplines, including CITIDEL, an NSDL-funded project focused on the Computer Science community.

Eileen McIlvain is the Pathways Project Coordinator for the National Science Digital Library (NSDL), a federally funded online collection of resources, tools and services that support science, technology, engineering and mathematics (STEM) education and research at all levels. She serves as the library's liaison to a set of 11 discipline- and audience-focused partnerships that engage trusted organizations and institutions with proven expertise in serving their target audiences. McIlvain joined NSDL in November 2005, after eight years with its geoscience member library, the Digital Library for Earth System Education (DLESE). Her experience with both programs has centered on support for and outreach to the broad spectrum of partners engaged in community-based distributed development of educational digital libraries. Her educational background includes an M.A. in Linguistics (University of Colorado) and a B.A. in Philosophy (Colorado College). eileen@ucar.edu

Manuel A. Pérez-Quiñones is an associate professor in the Department of Computer Science at Virginia Polytechnic Institute and State University. His research interests include human-computer interaction, personal information management, multiplatform user interfaces, user interface software, and educational uses of computers. Pérez-Quiñones received a DSc in computer science from The George Washington University. He is a member of the ACM and IEEE Computer Society. Professionally, he serves as a member of the Coalition to Diversify Computing and as member of the editorial board for the Journal on Educational Resources in Computing. perez@vt.edu.

11:15 a.m.-12:15 p.m.
BOF IV: Diversity and Computer Science Outreach
International Ballroom North

Discussion leaders: Ugochi Acholonu, Stanford University, and **Wanda Eugene,** Auburn University

The "diversity problem" in computing consists of two distinct components: access to technology and the opportunities to participate in substantive technological experiences for promotion of future technical learning. In this Birds of Feather forum we will present two Computer Science interventions aimed at youth and college students. The first intervention, done in the summer of 2006, was aimed at middle school students in an affluent city in California. In this setting access to technology was not a problem, but a large gap in technical experience between males and females existed as shown in the data collected. The second intervention looks at mechanisms for supporting minority students in the development of social capital which can help to eradicate barriers such as a perceived individualistic and weed out culture of engineering, ethnic isolation, and a lack of interaction with faculty and the broader university which may inhibit minorities from matriculating through college and entering graduate studies.

Ugochi Acholonu is a doctoral student in the Learning Sciences and Technology Design program at Stanford University. She received a master's in Computer Science with a specialty in Human Computer Interactions in 2005, and a bachelors in Electrical Engineering in 2003, both from Stanford University. Her research interests include computers as cognitive tools, user interfaces and gaming technology for the promotion of learning in young children, and cultural influences of access, use, and learning with technology. She works closely with Prof. Brigid Baron researching the growth of technological fluency and digital literacy in youth. acholonu@stanford.edu

Wanda Eugene is a doctoral student in the Human Centered Computing Lab at Auburn University. She is interested in how cultural, social and personal surroundings affect the appropriation of computational artifacts and ideas, and how they can serve as a resource for the design of new technologies to enhance the participation in engineering education. She received a bachelor of science degree in Electrical Engineering (2002) and a master's of science in Industrial Engineering (2003) from the Florida Agricultural and Mechanical-Florida State University College of Engineering, and a master of arts in Interdisciplinary Studies specializing in Instructional Technology and African American Studies (2006) from George Mason University. eugeuwa@auburn.edu

10:30 a.m.-12:00 p.m.
Papers Session II
International Ballroom Center

Implementation of DomCAT: The Domain Complexity Analysis Tool for Natural Language Dialog Processing

Shannon Duvall, Elon University

While dialog system technology is advancing, there is a lack of theory allowing the vastly different domains for systems to be compared. As a result, all predictions of the cost of building a new dialog system must be made by a dialog expert based on intuition and experience. Recently it has been proposed that entropy can be used as a complexity measure for dialog systems. These calculations would require domain specifications and understanding of information theory. This paper introduces the Domain Complexity Analysis Tool, or DomCAT. With this tool, anyone with basic knowledge of dialog systems can calculate system complexities and create new dialog domain specifications, and dialog complexity calculations can become standard for the field.

Evaluation of IEEE 754 Floating-Point Arithmetic Compliance across a Wide Range of Heterogeneous Computers

Guillermo Lopez, Michela Taufer and **Patricia Teller,** The University of Texas at El Paso

Scientific applications rely heavily on floating-point arithmetic and, therefore, are affected by the precision and implementation of floating-point operations. Although the computers we use are IEEE compliant, this only assures the same representation of floating-point numbers; it does not guarantee that floating-point operations will be performed in the same way on all computers. As a result, the same program run on different computers may yield different results. This paper is a first step in understanding the reason for this, in particular, in the case of the execution of Charmm on different computers. We report on our use of a well-known test suite, IeeeCC754, to evaluate IEEE 754 compliance across a wide range of heterogeneous computers with different architectures, operating systems, precisions, and compilers.

Bowl Championship Series Vulnerability Analysis

Caio Soares, George Page, Jonathan MacDonald, Sanjeev Baskiyar and **John Hamilton,** Auburn University; and **Gerry Dozier,** North Carolina A&T University

The Bowl Championship Series (BCS) is the system used to select the top two college football teams to play in a championship game at the end of a season. During the nine seasons played under the BCS, few have not caused considerable debate and controversy. We believe that an analysis of the BCS and its components is therefore required. This work uses a GRNN to model the eight polls that compose the ranking system of the BCS. Then, a genetic algorithm (GA) is used to evolve season schedules that would perform poorly under the current BCS. These difficult seasons are then analyzed to highlight weaknesses in the current model.

12:15-1:30 p.m.
Town Hall Meeting
Palm Ballroom 2

The Town Hall Meeting will provide an open forum for discussions about future Tapia events as well as possible programs that can be undertaken by the Coalition to Diversify Computing, a joint organization of the ACM, CRA and IEEE-CS, which is open to ideas for new projects that aid in increasing the diversity in the field of computing.

1:30 p.m.
Adjourn Tapia 2007

Poster Abstracts

6:00-9:00 p.m. Monday
Poster Session
Grand Foyer

Tapia 2007 attendees are invited to attend the poster session to learn about student research and talk with the researchers. Poster abstracts are listed alphabetically by last name of the author.

Broadband Websites: Accessible to All?

Yasmeen Ahmad, University of Dundee, Scotland

Over the last few years, the UK government has attempted to take steps to ensure that as many people as possible receive broadband services so that the UK becomes one of the leaders in the broadband market. Disappointingly, the government has not considered disabled users amongst its priorities and therefore has not ensured that broadband sites are accessible to all. Many of these sites do not allow disabled users to benefit from receiving information or registering online. They ignore the users who need websites to be accessible and discriminate in not providing facilities for these users on their websites.

Cache Improvement Techniques Reconsidered: A Write-Buffer Case Study

Bushra Ahsan, City University of New York

With the increasing gap between processor and memory, various methods are used to enhance cache performance and decrease traffic between processor and memory. However, the introduction of chip multiprocessors (CMPs) means these methods must be reconsidered. This poster presents a design for managing cache traffic resulting from writing back dirty blocks for private L1 cache to shared L2 cache for CMPs. For a single-core chip, a write buffer handles this efficiently, while for CMPs there are more options. In this poster, we explore how different choices can affect the performance in terms of access time, area and power.

The Effect of Memory Bandwidth on Processor Performance

Jerry Backer, City University of New York

With the increased traffic between the cache and the main memory (RAM), bandwidth requirement, particularly off-chip bandwidth, has increased. Moreover, with the external peripherals and the multiprocessor core technology, different components may need to access the main memory simultaneously, leading to contention and hence, performance loss. This poster presents the effect of off-chip bandwidth on the overall processor performance. Using the sim-outorder simulator of the SimpleScalar suite, we show the uneven distribution of traffic of the Spec2000 benchmarks as representative of real-life applications. In addition, we show the results of a new technique aimed at leveling the off-chip traffic.

The Electronic Fetal Monitor: Can Patients Interpret Information in a Heartbeat?

Sara Brickel, Virginia Institute of Technology

The purpose of this study was to determine if the interface design of an electronic fetal monitor display provides comfort, for a patient, which is based on an accurate interpretation of the information being provided. Interviews with mothers indicated that there is an element of comfort provided by the display. Non-medical participants were asked to interpret information displayed on a Philips Avalon FM20 Antepartum and FM30 Intrapartum electronic fetal monitor and determine whether contraction and fetal heart rate graphs indicated complications. The average participant scores from this cognitive walk-through proved that participants were not able to accurately interpret this information.

A Model for Sustainable After-School Robotics Programs in Underserved Schools

Christopher Bryant, Duke University

Recognizing the importance of technological proficiency, problem solving, teamwork, and creativity for success in an ever-changing world, many schools are adding robotics to their after-school enrichment offerings. While many of these programs are successful, unique characteristics of underserved schools present several challenges to program implementation and maintenance. To narrow the digital divide, the delivery mechanism for these programs must be specially tailored. By creating a highly structured, small group, project-based environment, many of the issues these programs face can be mitigated. This paper focuses on three years of a middle school program in North Carolina.

Educational Data Mining for Student Study Guides

Shana Collins, Johnson C. Smith University

We propose that educational data mining (EDM), the process of learning about students through examining their behavior, can be used to make online learning more adaptive, automatically and inexpensively. We will apply EDM techniques to three semesters of graded homework responses for an online discrete math class, and determine if the resulting models can be used to predict student test scores. The resulting models will be used to generate individualized study guides, whose effectiveness will be measured through student performance and satisfaction surveys. If successful, these methods can be used as a basis for creating inexpensive, scalable, adaptive tutoring systems.

Virtual Town Square for the Blacksburg Community

Mariheida Cordova, Virginia Institute of Technology

Social networks, such as Facebook, have had a great impact recently. They have been able to attract many people for mostly social purposes. One area where they have not been explored is providing a space where people could socialize and be aware of what is happening in their town at the same time. Following the social networking approach, we are building a new version of the Blacksburg Electronic Village, called the Virtual Town Square, which will provide members with opportunities for communication, socialization and collaboration with groups. It will also provide them with news feeds of events in their town.

Opportunistic Source Coding for Data Gathering in Wireless Sensor Networks

Tao Cui, California Institute of Technology

We propose a jointly opportunistic source coding and opportunistic routing (OSCOR) protocol for correlated data gathering in wireless sensor networks. OSCOR improves data gathering efficiency by exploiting opportunistic data compression and multi-user diversity on wireless broadcasts. OSCOR attacks challenges across network protocol layers by incorporating a slightly modified 802.11 MAC, a distributed source coding scheme based on Lempel-Ziv code and network coding, and a node compression ratio-dependent metric combined with a modified Dijkstra's algorithm for path selection. We simulate OSCOR's performance and show it reduces the number of transmissions by nearly 25 percent compared with other schemes in small networks.

Developing an Interface for Capturing and Sharing Information on Research Posters

Karen DelDuca, The College of New Jersey

Tablet PC technology provides an opportunity to digitally capture and share information that would be scribbled in a personal notebook. We conducted interviews with domain and technology experts to augment research posters with digital information so that additional multimedia content can be displayed and user feedback can be obtained. Poster information can be accessed, and poster locations can be recorded so that a history is maintained. This paper presents an approach to designing an interface that supports this functionality and suggests ways it can be used.

Coronal Loop Detection in Solar Images

Nurcan Durak, University of Louisville

To monitor abnormal events in the sun and to support solar physics research, NASA has taken solar pictures every minute since 1995. Images containing coronal loops are especially important to researchers. The search of images with coronal loops is currently performed manually and is thus tedious and time consuming. In this study, we aim at retrieving these images automatically. We do this by applying image preprocessing techniques, dividing each image into blocks, extracting important features from each block, and training classifiers with these features. Our classifiers to date obtain 80 percent of recall and 63 percent of precision on our training set.

Wu's Castle: Teaching for Loops and Arrays using Games

Michael Eagle, University of North Carolina - Charlotte

The Game2Learn project seeks to recruit and retain novice computing students by presenting programming concepts in a less intimidating setting, while leveraging the interactivity and motivation of games. We present Wu's Castle, a two-dimensional role-playing game that teaches loops and arrays in an interactive, visual way. In Wu's Castle, players program magical creatures called machina to create armies of snowmen. Players can practice programming and easily identify mistakes in a safe environment. The results of our pilot pre-test post-test study suggest that Wu's Castle implements good practices for teaching programming within a game.

A C++ Class Supporting State-Deficient Adjoint State Methods

Marco Enriquez, Rice University

The adjoint-state method is widely used for computing gradients in simulation-driven optimization problems. The adjoint-state evolution equation requires access to the entire history of the system states. There are instances, however, where the required state for the adjoint-state evolution is not readily accessible. This poster introduces a C++ class, StateHistory, to support multiple solutions to this problem. Derived StateHistory classes implement a (simulation) time-altering function and data-access functions, which can be used in tandem to access the entire state history. These ideas were implemented in the context of TSOpt, a time-stepping library for simulation-driven optimization algorithms.

Driving Simulation Environment for Modeling of Human Behavior

Mario Guajardo, University of Texas at Austin

The goal of our research is to build a realistic model of human behavior that predicts the distribution of cognitive and bodily resources when performing complex tasks such as driving a car. Our driving environment is full of varied time-critical inputs that humans are familiar with handling. It provides a set of components and functions that facilitate the staging of experiments and the monitoring of advanced human behaviors. Hence, we can test humans and human behavioral models in a realistic VR setting with roads, traffic lights, stop signs, pedestrians and other vehicles to study everyday behaviors in real time.

Handling Self-modifying Code Using Software Dynamic Translation

Joy Kamunyori, University of Virginia

Self-modifying code is code that overwrites and changes its own instructions during its execution. Code often self-modifies for benign reasons, such as in Just-In-Time (JIT) compilers. This programming technique can also be used for malicious purposes, as in metamorphic viruses, which transform themselves in every generation to evade detection. Strata, a software dynamic translation framework developed at the University of Virginia, was not originally implemented to handle self-modifying code. This poster details the extensions made to Strata in order to allow the framework to recognize and safely handle self-modifying code.

Development of Security Strategies Using Kerberos in Wireless Networks

Yoney Kirsal, Middlesex University, England

Despite advances in network security, malicious attacks are showing a significant increase, compromising data integrity, confidentiality and trust. Authentication mechanisms coupled with strong encryption techniques are used; but well-equipped intruders still succeed in compromising system security. This study presents an approach dynamically renewing keys under pseudo-secure situations, significantly reducing the chances of potential intruders. Since the proposed approach involves temporary interruption to link/server access, it has implications for performance degradation. After describing a protocol to achieve improved security for authentication, an analytical method is used to evaluate the cost in terms of the degradation of system performability. Various results are presented.

Social Software for Governments: Government Next Steps to Improve Community Participation

Jose Lombay-Gonzalez, Universidad de Puerto Rico, recinto de Mayagüez

The Blacksburg Electronic Village (BEV) provides the citizens of the Blacksburg, Virginia, with a community website with many services and sources of information. This paper presents the initial ideas in the design of social networking software that will expand these existing services and provide the government of Blacksburg with features to elicit citizen feedback and support citizen-to-citizen deliberation, as well as providing easily accessible information concerning town activities. We used Really Simple Syndication to provide useful information to citizens and extended an existing plugin to add valuable features such as ICS subscriptions.

Learning Locomotion Behaviors for Adaptation of Omni-directional Walking Patterns

Lonnie Parker, Georgia Institute of Technology

To further research in human-robot interaction, this poster presents the use of a finite state machine and a genetic algorithm to learn walking patterns for a six-legged robot. A finite state machine outlines 27 different states represented by various combinations of robot leg orientations. These states were hard-coded into each unit's primary controller, and a Java program generated and implemented a modified genetic algorithm to learn a forward walking pattern. Experiments determined that the optimal gene length for each chromosome was six. This provided the chromosome with the highest fitness while preventing excessive leg movement of the robotic platform.

The Role of Formative Usability Evaluation in the User-Centered Website Design Process

NyEsha Robinson, North Carolina Agricultural and Technical State University

A Usability Evaluation study was conducted to identify problems and recommendations for improvement for the VT ISE Department website in the context of the user-centered design process. The usability testing consisted of two phases: experts evaluating the website under Neilson's 10 heuristics, and ordinary VT users testing the site for the same issues. Each non-expert participant was given general instructions and a pre-survey of their demographics and level of Internet experience. The participants were observed during testing and given a post-survey interview to gather additional feedback. The results of this study and a future research discussion are presented.

Toward a Semantic Modeling of Learners in E-learning from Communities of Practice Perspective

Akila Sarirete, Institut National d'Informatique, Algeria

In this poster, we propose a design for learning that enables e-learning systems to benefit from the social learning theory underlined within the communities of practice (CoPs). CoPs are considered to be at the heart of knowledge management. The learner is considered as part of a community and shares knowledge with other members of the CoP. We will propose a learner profile model for e-learning systems taking into account the community factor, the learner participation and knowledge reification. The poster will show current research in user modeling and our contribution.

Enhancing Web Accessibility for People with Cognitive Disabilities

William Shellington, Norfolk State University

People with cognitive disabilities can have problems related to memory, problem-solving, attention, and comprehension. This work utilizes the notion that each person is unique, and it provides a prototype where users control how content is presented through a simple profile editor. The prototype uses XML, CSS, and ACCLIP to enable users to create a unique style sheet for web page display. Future directions for this work will explore impact on social computing and accessibility.

Usability Size N

Andrea Williams, Auburn University

In today's software development environment, building a usable, customer-satisfactory product is key to success. User satisfaction and usefulness are measured using studies of potential customers, which are expensive. This can cause problems because some managers simply fall back on cheaper heuristic evaluations using developers as testers and leaving out the real users. By using Applications Quest, a data mining clustering tool, we would like to see if, given a population of size N, there is a subset that would yield the same results as the larger population. Using such a subset allows the developers to stay on time and budget.

Optimization Framework for American-Style Option Valuation with Financial Constraints

Donald Williams, Rice University

Fundamental to many complex financial derivatives is the valuation and optimal exercise of American-style options, one of the most important and intellectually challenging problems in option pricing theory. This work proposes a direct computational algorithm for valuing American-style options in the presence of economically significant constraints. The algorithm solves the discretized linear programming formulation of the problem via constrained interior-point optimization. Also, we address the valuation of crack-spread options as an example of incorporating additional financial constraints within the optimization framework. Some example computations are presented to show the general applicability of the methodology.

A Spatio-Temporal Model for Bias Estimation in Radar Rainfall Data

Talithia Williams, Rice University

This research develops and employs a regime-switching, autoregressive state space model to improve current methods of accounting for bias in rainfall estimation. Typical devices used to measure rainfall, namely rain gauges and weather radars, are prone to measurement error and systematic bias. Because the data collected from these devices is used in Flood Alert Systems to determine runoff and provide flood warnings, it is critically important that rainfall values are accurately quantified. The proposed autoregressive state space model addresses inherent problems, often ignored in current methods, by adjusting for storm intensity while accounting for spatial and temporal nonstationarity.

Using RFID to Support Digital Information Sharing on the Non-Digital Objects

Gregory Wilson, Georgia Institute of Technology

RFID provides opportunities to augment any object with digital knowledge. Objects that could benefit from this enhancement include posters (research or entertainment), paintings, sculptures, etc. Combining these objects with digital content will create open forums for information sharing and feedback opportunities. We test this theory by providing a tablet PC with RFID capabilities to allow a way for additional multimedia information to be accessed from a research poster as well as the ability to leave comments and ratings.

Pathways to Career Opportunities Exhibit Area

International Foyer

Conference attendees should be sure to visit the Pathways to Career Opportunities exhibit area to learn more about the programs and potential career opportunities offered by the Tapia 2007 sponsors and supporters. These supporters, who represent academia, government and industry, will have information on hand regarding graduate school opportunities, summer internships, faculty fellowships, post-doctorate internships and employment opportunities, as well as general information about their organizations.

The Pathways to Career Opportunities area will be open:
Monday, October 15, 8:30 a.m.-5:30 p.m.
Tuesday, October 16, 8:30 a.m.-5:30 p.m.

Representatives from the organizations participating in the Pathways to Career Opportunities will be available to talk with attendees on:
Monday, October 15, 10:00-10:30 a.m. and 3:00-3:30 p.m.
Tuesday, October 16, 10:00-10:30 a.m. and 3:00-3:30 p.m.

Sponsors and Supporting Organizations

The 2007 Richard Tapia Celebration of Diversity in Computing Conference would not have been possible without the tremendous dedication and contributions of our sponsors, the Association for Computing Machinery and the IEEE Computer Society, in cooperation with the Computing Research Association, our supporting organizations, and our committee members. The Coalition to Diversify Computing, which organized Tapia 2007, extends a sincere thank you to everyone, including the participants, who made this event possible.

The Coalition to Diversify Computing (CDC)

Nina Berry, nmberry@sandia.gov
http:// www.cdc-computing.org/

The Coalition to Diversify Computing is a joint organization of the ACM, IEEE-CS and CRA. The goal of CDC is to address the shortfall of highly trained workforce of scientists and engineers capable of meeting the needs in the broad area of computing. CDC projects target students, faculty and professionals with expressed intent of increasing the number of minorities successfully transitioning into computing related careers in academia, industry, and national laboratories. The diverse membership of CDC from academia, industry, and national laboratories enables a variety of different perspectives and approaches to be utilized in achieving the aforementioned goals.

CDC's projects are active, member-driven, and designed to leverage the resources of organizations that share the goals of the CDC. Projects include:

- Richard Tapia Celebration of Diversity in Computing Conference, 2001, 2003, 2005, 2007
- Academic Workshops for Underrepresented Participants
- Sending Students/Mentors to Conferences
- Computing Research Experiences for Undergraduates
- Distributed Mentor Project
- CDC/CRA-W Broadening Participation in Computing (BPC) Alliance
- Cooperation with Other BPC Alliances
- IEEE-CS Distinguished Visitor Program Liaison
- Outreach to Societies
- Distributed Rap Sessions
- CDC Database

The Association for Computing Machinery (ACM)

http://www.acm.org

Founded in 1947, ACM is a major force in advancing the skills of information technology professionals and students worldwide. Today, over 80,000 members and the public turn to ACM for the industry's leading Portal to Computing Literature, authoritative publications and pioneering conferences, providing leadership for the 21st century.

The IEEE Computer Society

http://www.computer.org

The IEEE Computer Society traces its origins to the 1946 formation of the Subcommittee on Large-Scale Computing of the American Institute of Electrical Engineers (AIEE). Today, IEEE-CS offers its members many benefits including complimentary subscription to the Computer magazine, free on-line access to 300 computing and IT books, free on-line access to 350 distance learning course modules in more than 40 subjects including Java, Cisco, Sun, Microsoft, and more, and discounted subscriptions to more than two dozen periodicals.

The Computing Research Association (CRA)

Carla Romero, carla@ cra. org
http://www.cra.org

The Computing Research Association (CRA) is an association of more than 200 North American academic departments of computer science, computer engineering, and related fields; laboratories and centers in industry, government, and academia engaging in basic computing research; and affiliated professional societies. CRA's mission is to strengthen research and advanced education in the computing fields, expand opportunities for women and minorities, and improve public and policymaker understanding of the importance of computing and computing research in our society.

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Jan Cuny, jcuny@nsf.gov
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The National Science Foundation is an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." With an annual budget of $5.5 billion, NSF is the funding source for approximately 20 percent of all federally supported basic research conducted by America's colleges and universities.

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Empowering Leadership Alliance: Computing Scholars of Tomorrow

Richard Tapia, rtapia@rice.edu
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Begun in early 2007, the Empowering Leadership (EL) Alliance is building a vibrant nationwide network engaging underrepresented minority students in computing disciplines at research universities. Students, faculty members, and other professionals are developing a supportive community critical to students scattered sparsely across the country with significantly smaller and less robust networks than more established student support networks. Taking full advantage of the resources in the national computing community, the EL Alliance provides students with mentoring by some of the most successful computing researchers in the country, in-person meetings with national leaders, and online support. The alliance, currently made up of more than 20 institutions - research universities, government labs, professional societies, and industry and business organizations - is led by Richard Tapia at Rice University and funded by the National Science Foundation's Broadening Participation in Computing program. We invite you to join the network.

Google

Meredith Carroll, meredith@google.com
www.google.com/jobs/tapia

Google aspires to be an organization that reflects the globally diverse audience that our search engine and tools serve. We believe that in addition to hiring the best talent, the diversity of perspectives, ideas, and cultures leads to the creation of better products and services. As the billions of pages in our index shows, we're great believers in inclusiveness. Stop by our booth to visit us. We look forward to meeting you.

Microsoft

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We work hard at Microsoft to think inclusively, value differences, and provide the necessary tools to give each employee a chance to do his or her best work. This approach has resulted in a wealth of fresh ideas and creative problem solving as we focus on the customers and markets we serve, the business processes and practices we use, the products and services we develop, and our growing workforce. And we're not finished. We know that diversity at Microsoft, like the rest of our business, is a work in progress - one that we are very optimistic about. By fully pursuing the company's mission in all parts of the globe and in keeping with what we value and what the citizens in each country value, Microsoft has established a comprehensive plan to promote and integrate diversity at every level within our organization and in everything we do.

National Center for Supercomputing Applications

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The National Center for Supercomputing Applications (NCSA), established in January 1986, is a national center anchored at the University of Illinois and is one of the five original centers in the National Science Foundation's Supercomputer Centers Program. Since then, NCSA has contributed significantly to the birth and growth of the worldwide cyberinfrastructure for science and engineering, operating some of the world's most powerful supercomputers and developing the software infrastructure needed to efficiently use these systems (for example, NCSA Telnet and, in 1993, NCSA Mosaic™, the first readily available graphical Web browser). Today the center is recognized as an international leader in deploying robust high-performance computing resources and in working with research communities to develop new computing and software technologies. NCSA is at the heart of the university's Institute for Advanced Computing Applications and Technologies. The National Science Foundation, the state of Illinois, the University of Illinois, industrial partners, and other federal agencies support NCSA.

Princeton University

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Recognized globally for academic excellence, Princeton University is a vibrant community of scholarship and learning. As a research university, it seeks to achieve the highest levels of distinction in the discovery and transmission of knowledge and in the education of graduate and undergraduate students. The School of Engineering and Applied Science, and the departments of Electrical Engineering and Computer Science, like the university itself, are unique in combining the strengths of a world-leading research institution with the qualities of an outstanding liberal arts college. Our School of Engineering conducts about $50 million a year in research funded by government agencies and industry in areas ranging from biological sensors to aerospace engineering to next-generation Internet design. In both its teaching and research, Princeton reaches beyond pure technical achievement and incorporates a broad understanding of the social, economic and cultural context that drives and is driven by technology. The university places a high value on harnessing the combined viewpoints of many academic disciplines and personal backgrounds to solve real-world problems. Princeton strives to educate students who become leaders not just in technical fields, but in all areas of public service, business, law and medicine.

Rice-Houston Alliance for Graduate Education and the Professoriate

Theresa Chatman, tlc@rice.edu
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Situated in one of the nation's largest, most culturally diverse cities, the Rice-Houston AGEP unites many of the city's research and teaching universities in the common mission of significantly increasing the number of underrepresented students earning the Ph.D. in science, technology, engineering and mathematics (STEM) fields. The Rice-Houston AGEP program offers a summer research program for undergraduates across the country, and support for minority graduate students at Rice University. The summer program includes a $4000 stipend and housing and travel support. The undergraduates participate in mentoring, community-building, and professional development activities that are designed to encourage them to pursue doctorate degrees. The year-round graduate program at Rice includes stipends, tuition coverage, and a health insurance supplement, as well as a summer stipend. Students are encouraged to participate in national conferences to present their research, and are provided with professional development activities. A strong recruitment program focuses on the benefits of attending graduate school. You must be a U.S. citizen or permanent resident to participate in AGEP's activities. AGEP is made possible by support from the National Science Foundation, Cooperative Agreement Number HD-0450363.

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College of Computing, Georgia Institute of Technology

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The Georgia Institute of Technology is one of the nation's premiere research universities. Ranked seventh among U.S. News & World Report's top public universities, Georgia Tech's more than 18,000 students are enrolled in its Colleges of Architecture, Computing, Engineering, Liberal Arts, Management and Sciences. Tech is among the nation's top producers of women and African-American engineers and computer scientists. The Institute offers research opportunities to both undergraduate and graduate students and is home to more than 100 interdisciplinary units plus the Georgia Tech Research Institute.

Hewlett Packard (HP)

Wendy Carmody, wendy.carmody@hp.com
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No company offers more opportunities for achievement than HP. Whether we're developing infrastructure for emerging nations, using nanotechnology to reinvent computing, setting the standard for online security, or interpreting large datasets to treat disease, the work HP people do changes everything. We use technology to help our customers fulfill their potential. We help you realize your potential by providing an environment where you'll be empowered and inspired to do the best work of your life. HP's annual R&D investment of nearly $4 billion (USD) fuels the invention of products, solutions and new technologies. We produce an average of 11 patents a day worldwide. HP Labs provides a central research function for the company which is focused on inventing new technologies to improve our customers' lives, change markets and create business opportunities. Our strategy is to offer products, services and solutions that are high tech, low cost and deliver the best customer experience.

Lawrence Livermore National Laboratory

Linnea M. Cook, cook13@llnl.gov
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Lawrence Livermore National Laboratory (LLNL) is a premier research and development laboratory. For more than half a century, we have applied cutting-edge science and engineering to enhance the nation's security. When LLNL was founded in 1952, the consuming security threat to the U.S. was the nuclear arsenal of the Soviet Union. For years, our energies, talents and resources were dedicated to checkmating that menace. Today, new perils have arisen that are radically different and vastly more complex, and we are directing our world-class scientific and technological resources against these threats. At the same time, we are pushing the frontiers of science and technology to make breakthroughs in areas such as energy research, bioterrorism, environmental science, chemistry, computer science and basic science. The Laboratory serves as a resource to the U.S. government and is a partner with industry and academia. As a result of these national missions, LLNL is a leader in high-performance computing and home to several of the world's fastest computers. Our computer scientists advance the state of the art in numerical simulation, visualization and knowledge discovery as well as control systems, database management, information technology and cyber security. These computational tools allow researchers at LLNL and elsewhere to investigate phenomena that are far beyond the reach of physical experimentation.

Oak Ridge National Laboratory

Debbie McCoy, mccoydd@ornl.gov
http://computing.ornl.gov/

Oak Ridge National Laboratory (ORNL), managed by UT-Battelle, is DOE's largest science and energy laboratory. ORNL is an international leader in a range of scientific areas. The laboratory's six major scientific competencies include advanced materials, complex biological systems, energy, high performance computing, neutron science, and national security. The Spallation Neutron Source at ORNL is a $1.4B project and is the world's foremost center for neutron science research. The Office of Science's ORNL Leadership Computing Facility hosts the fastest unclassified high-performance computing system in the world. ORNL hosts hundreds of students majoring in computer science, the computational sciences, information technology, and engineering each year for periods from 10-12 weeks during the summer to semester-long and co-op programs.

Department of Computer Science at Texas A&M University

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The Department of Computer Science offers undergraduate and graduate degrees in computer science and computer engineering. We have world-renowned faculty in core areas such as software, information, intelligent systems and robotics, foundations of computing, systems, human-centered systems, and software engineering. Further, we have faculty in multi-disciplinary areas such as bioinformatics, brain networks, computational science, security, and humanities informatics. Texas A&M University offers a rich history of tradition that is unmatched at any other institution.

University of California, Berkeley Department of Electrical Engineering and Computer Sciences

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UC Berkeley is internationally known for its academic excellence and commitment to diversity. Berkeley's Computer Science Department is ranked among the top three in the nation. More students who earn Bachelor's degrees at Berkeley complete Ph.D.'s than graduates of any other American university. The impact of CS faculty research has had important impact on areas as diverse as theory, computer systems, vision, robotics and architecture. We are proud of the strength and longevity of our women's programs and the leadership roles played by Berkeley's CS women doctoral graduates at universities nationwide.

USENIX Association

Ellie Young, ellie@usenix.org
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USENIX is the Advanced Computing Systems Association. For over 30 years, it has been the leading community for engineers, system administrators, scientists, and technicians working on the cutting edge of the computing world. USENIX conferences are the essential meeting grounds for the presentation and discussion of technical advances in all aspects of computing systems. For more information about the USENIX Association, visit http://www.usenix.org.

Bronze Supporters

Anita Borg Institute for Women and Technology

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Since 1995, ABI has developed tools and programs designed to help industry, academia and government recruit, retain and develop women technology leaders. By providing inclusive platforms designed to ensure women's voices, ideas and spirits will result in higher levels of technical innovation, ABI delivers programs that are changing the world for women and for technology.

Auburn University

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Auburn is a comprehensive land-grant and research institution located in Auburn, Alabama. It is one of the largest universities in the South, remaining at the educational forefront with our emphasis on a blend of arts and applied sciences. The university continuously changes to accommodate today's needs, while still respecting the traditions and spirit of Auburn. The Computer Science and Software Engineering Department offers three undergraduate degrees: Bachelor of Science in Computer Science, Bachelor of Wireless Engineering, and Bachelor of Software Engineering. At the graduate level students can earn a Master of Science, Master of Software Engineering, as well as a Doctorate of Philosophy degree. Auburn's Computer Science and Software Engineering Department takes pride in being a leader in broadening participation in computing. The department has the largest number of African-American Computer Science Ph.D. students in the country.

Department of Computer Science, Georgetown University

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Georgetown University is one of the nation's most prestigious universities, ranked 23rd among national universities by the U.S. News 2008 report. The Computer Science Department was officially formed in 1985. In embracing Georgetown's tradition, the department has been a leader in undergraduate education and research. We pride ourselves in establishing rich personal relationships between our faculty and students. With small class sizes and spacious research facilities, our undergraduate students have the opportunity to work on cutting edge research with faculty members. The 2007-2008 academic year realizes a turning point in the department. This fall, we have opened our doors to a new graduate program. Offering a new Master of Science degree in Computer Science, we are leveraging the teaching and research strength of our faculty in the areas of algorithms, artificial intelligence and data mining, security and software engineering.

Harvey Mudd College

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Harvey Mudd College is a unique liberal arts college of engineering, science and mathematics. A member of The Claremont Colleges consortium, HMC combines an intimate learning community of 725 students and 85 faculty with the larger-scale resources of a university. Since its founding in 1955, HMC has led the way in innovative undergraduate engineering and science education. We provide hands-on research opportunities, a strong focus on the humanities and social sciences, and an exceptional faculty. We are renowned for our gifted students, our rigorous curriculum, and our sense of humor. We strive for excellence without arrogance.

Lawrence Berkeley National Laboratory

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http://www.lbl.gov

Founded in 1931, Ernest Orlando Lawrence Berkeley National Laboratory (LBNL) is the oldest of America's national laboratories and home to 11 Nobel laureates. LBNL is home to the Department of Energy's National Energy Research Scientific Computing Center (NERSC) and the Energy Sciences Network (ESnet), and is a world leader in scientific computing and networking. Berkeley Lab's HPC and networking capabilities and facilities are advancing DOE research programs by providing leading resources and expertise in computational science. The men and women of Berkeley are dedicated to solving the most pressing scientific challenges, from designing nanotechnologies to unraveling the secrets of the universe.

National Center for Women and Information Technology

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The National Center for Women and Information Technology (NCWIT) is a capacity-building coalition of over 100 prominent corporations, academic institutions, government agencies and non-profits working aggressively to increase women's participation in information technology (IT). NCWIT believes that women's participation is a compelling issue of innovation, competitiveness, and workforce sustainability, and its work connects efforts along the entire pipeline, from K-12 and higher education through industry and academic careers.

Rensselaer Polytechnic Institute

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Since Rensselaer Polytechnic Institute awarded its first Ph.D. in Computer Science in 1969, we have remained in the forefront of computer science research and education. We currently have a critical mass of talented researchers in the areas of bioinformatics, computational science and engineering, computer vision, data mining, database systems, graphics, networking, parallel and distributed computing, robotics, sensor networks, and theory.

Department of Computer Science, Tufts University

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The mission of Tufts' Computer Science Department is to provide undergraduates and graduate students with the durable knowledge necessary to become future leaders in the rapidly evolving discipline of Computer Science. In particular we give each graduate a solid foundation in theory, programming, systems and in interdisciplinary applications of computer science. Computer science majors at Tufts are involved in machine learning, computational biology, operating systems and networks, programming languages, graphics, computer security, software engineering and many other computer applications that allow others to manage, understand and display vast amounts of information productively and effectively. Many become industry leaders in technology; others work in interdisciplinary teams to create products and design solutions for the future in many areas of science, engineering and medicine.

University of Michigan

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The University of Michigan is at the forefront of the information and computing fields, with world class educational and research programs in information (si.umich.edu), computer science and engineering (www.eecs.umich.edu), industrial and operations engineering (ioe.engin.umich.edu), and bioinformatics (bioinformatics.med.umich.edu). Each of these programs is outstanding on its own and is ranked among the best in the nation, but faculty and students also collaborate across programs to achieve an unmatched synergy. Cross-disciplinary research teams and faculty with joint appointments create an unrivaled collaborative environment for education and innovation that encompasses the full range of information and computing fields. All within the largest public research university in the nation. Our students flourish in this environment, excelling and making their mark while at U-M, then going on to become the next generation of IT leaders in the Information Age.

Contributors

IBM Research

Bill R. Strachan
http://www.research.ibm.com/

IBM researchers in our eight labs around the world are working with each other and with clients, universities and other partners on projects that vary from optimizing business processes to inquiring into the Big Bang and the origins of the universe. Our focus is to continue to be a critical part of IBM's success by balancing projects that have an immediate impact with those that are long-term investments.

iRobot

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iRobot delivers innovative robots that are making a difference in people's lives. From cleaning floors to disarming explosives, we constantly strive to find better ways to tackle dull, dirty and dangerous missions - with better results. Founded in 1990 by roboticists from the Massachusetts Institute of Technology, iRobot designs behavior-based, artificially intelligent robots. Powered by iRobot's proprietary AWARE™ Robot Intelligence Systems, our robots are designed to navigate through complex and dynamic real-world situations, from maneuvering around furniture to searching abandoned buildings. Our robots are highly sophisticated, yet practical and easy to use.

Northeastern University

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Founded in 1898, Northeastern University is a private research university located in the heart of Boston, and a leader in interdisciplinary research, urban engagement, and the integration of classroom learning with real-world experience. Our signature coopera-

tive education program, one of the largest and most innovative in the world, is ranked among the best in the nation by *U.S. News & World Report.* We offer a comprehensive range of undergraduate and graduate programs leading to degrees through the doctorate in six undergraduate colleges, eight graduate schools, and two part-time divisions.

Rochester Institute of Technology

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Established in the summer of 2001, the Golisano College is the newest and largest of eight colleges at RIT. Offering myriad degree programs at both the undergraduate and graduate levels - as well as a Ph.D. in computing and information sciences - the Golisano College is one of the most comprehensive computing colleges in the United States. Positioned to be a national leader in the computing disciplines, the college includes the departments of computer science; information technology; networking, security, and systems administration; and software engineering; as well as the Center for Advancing the Study of Cyberinfrastructure, the research arm of the college. With its focus on both interdepartmental and inter-college cooperation, the college addresses computing in the broadest sense.

Department of Computer Science at University of Illinois at Urbana Champaign

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At the University of Illinois at Urbana-Champaign, the Department of Computer Science recognizes that IT is a ubiquitous technology capable of supporting humans and their intellectual activities, augmenting and enhancing the human experience. DCS has been at the forefront of the discipline, among the world's most highly ranked programs, since its inception, pushing frontiers, defining the future, and working to engage, develop, and support the effectiveness of a large and diverse cadre of the world's most accomplished professionals. As the flagship institution of the Illinois state university system, UIUC is a public institution committed to promoting the inclusion of under-represented groups across the broad range of computing and information technology.

Students and Technology in Academia, Research and Service (STARS) Alliance

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http://starsalliance.org/

The Students and Technology in Academia, Research and Service (STARS) Alliance is a system of regional partnerships among academia, industry, K-12 and the community to broaden participation in computing. Members include UNC Charlotte, NC State, Johnson C. Smith, NC A&T, Meredith, Shaw, St. Augustine's, Landmark, Georgia Tech, Auburn, Spelman, Florida State, Florida A&M, USF Lakeland, Polk, New Orleans, Virginia Tech, Hampton, and the University of South Carolina with more than 80 regional partners. The Alliance serves as an incubator for best practices, including Pair Learning, Culturally Situated Design Tools, Teaching Students with Disabilities, and Tiered Mentoring. The Alliance-wide STARS Leadership Corps catalyzes regional partnerships to combine K-12 recruitment with college retention and workforce development. Corps activities emphasize the central values of technical excellence, leadership, civic engagement, service and community building. The Corps is a call-to-action to college students to recruit, develop, and become the next generation of computing professionals.

University of South Florida

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The University of South Florida is one of America's top metropolitan research universities. At USF, we are focused on formulating bold ideas and using our research resources to create innovative solutions for our global community. Students here are spearheading advances in numerous fields, and work in partnership with faculty and the community to assure their academic endeavors lead to real-world success. Computer science and engineering emerged some 30 years ago as a promising new field for engineering research and development. Today, the discipline stands as a cornerstone of the field of engineering. Here in the Department of Computer Science and Engineering (CSE) at USF, we take pride in the fact that, as the youngest of the College of Engineering's six departments, we have, in our first 25 years of existence, shown an impressive record of achievement. We are a young and energetic department establishing ourselves as one of the premiere computer science and engineering departments in the nation.

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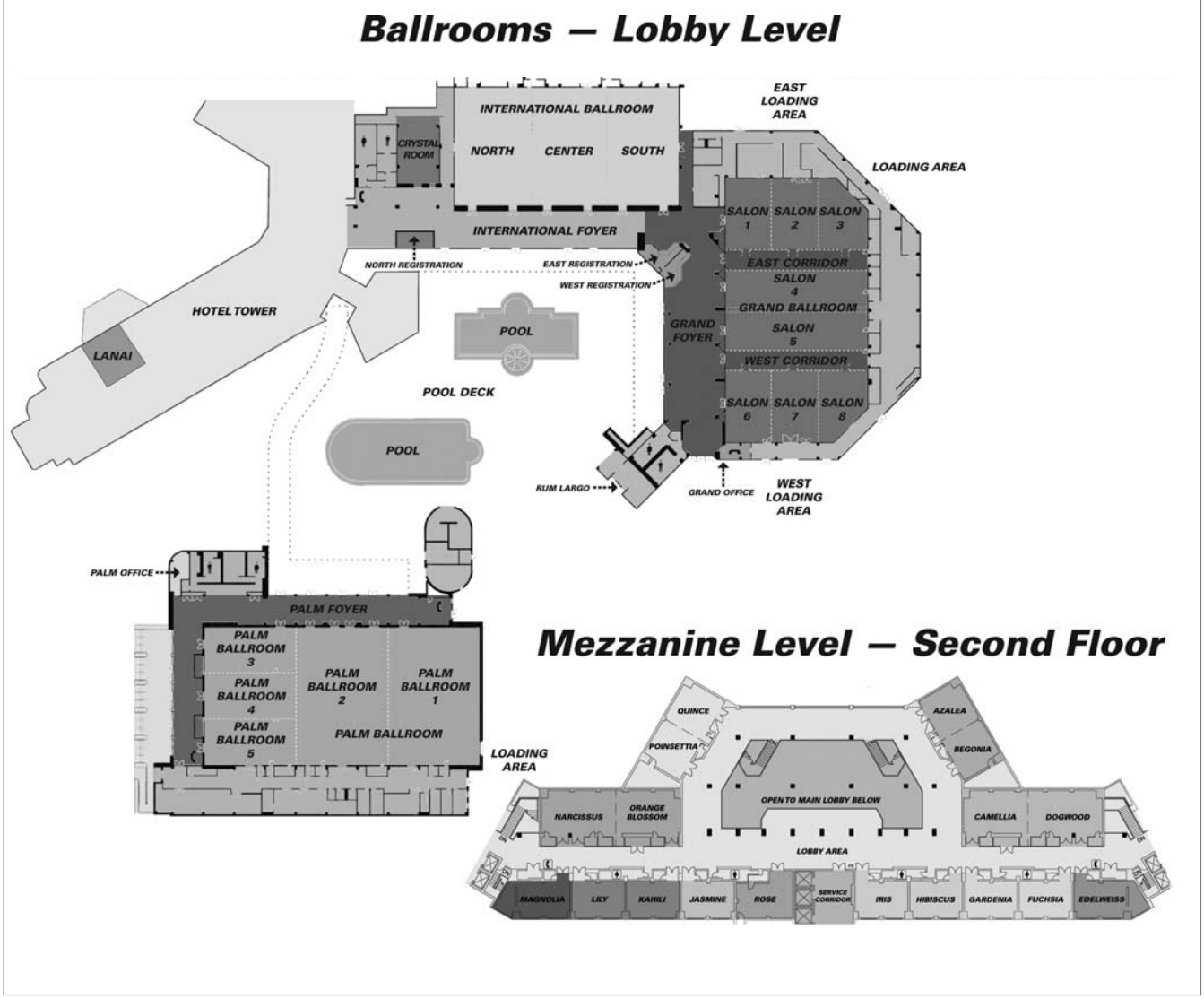

Notes

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The 2007 Richard Tapia Celebration for Diversity in Computing is organized by the Coalition to Diversify Computing and co-sponsored by the Association for Computing Machinery and the IEEE Computer Society, in cooperation with the Computing Research Association.

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