Welcome to West Point!

It is our great pleasure to host the 2011 ACM Conference on Information Technology Education. The theme of this year’s conference is “Growth and New Vistas.” The academic field of IT is experiencing many changes. As we enter a new decade in the Digital Age, IT will continue to face new opportunities, changes, and challenges. How do we continue to grow the profession and encourage more students to pursue IT? What is the scope of research for IT? What are the best practices for covering the knowledge areas in the IT Model Curriculum? How do we balance the challenges of accreditation against the need for curriculum evolution?

Over the years, we have found this conference to be both a well spring of ideas to address issues such as the above and a much needed opportunity to network and bond with fellow IT educators. We hope you find this year’s conference as beneficial and rewarding as the many we have attended in the past.

We are truly fortunate this year to have Dave Ferrucci as our keynote speaker. Dave was a lead designer for the IBM Watson design team. We have heard him speak before, and we look forward to an exciting presentation. Other conference social activities include a unique tour of the West Point’s cadet area and a beautiful and collegial boat ride on the scenic Hudson River.

The call for papers attracted 95 submissions from Asia, Canada, Europe, Africa, and the United States. The program committee accepted 49 papers, 13 posters, and 5 panels. This year the SIGITE reviewer pool grew substantially and we had over 90 reviewers and thus each submission was evaluated by at least four reviewers. The program committee would also like to thank those dedicated emergency reviewers who stepped in at the last moment to review one or two extra papers under tight time constraints.

SIGITE 2011 is truly a team effort, and we would like to acknowledge and thank Dave Armitage for all his successful efforts as Sponsorship Chair, Mark Stockman for his excellent leadership and guidance, and all of our sponsors for their generous support of this event (EMC, NetApp, USF Polytechnic, Mount Royal University).

We would also like to thank the many people who worked so hard behind the scenes on the many administrative challenges and needs. These include Christa Chewar for running the Conference Registration, April Mosquis at ACM for assistance with overall planning, Lisa Tolles at Sheridan Printing for organizing the proceedings, Henry Walker for administering the paper submission system, Ken Baker for helping set up the submission database, and Tiki Durand at the Hotel Thayer for all of her time and energy.

We hope that you will find the conference’s program to be both inspiring and thought-provoking and that the conference will provide you with a valuable opportunity to share ideas with other researchers and practitioners from institutions around the world.

Bryan Goda & Edward Sobiesk
SIGITE’11 Conference Co-Chairs
United States Military Academy, USA

Randy Connolly
SIGITE’11 Program Chair
Mount Royal University, Canada
General Chairs
Bryan Goda  and Edward Sobiesk
United States Military Academy

Program Chair
Randy Connolly
Mount Royal University, Canada

Sponsorship Chair
Dave Armitage
University of South Florida Polytechnic

Proceedings Chair
Randy Connolly
Mount Royal University, Canada

Local Arrangements Committee
Christa Chewar – Registration
United States Military Academy
Tiki Durand – Hotel Thayer Conference Planner

Steering Committee Chair
Mark Stockman
University of Cincinnati

Steering Committee
Dave Armitage
University of South Florida Polytechnic

Ken Baker
University of Cincinnati

Randy Connolly
Mount Royal University

Norm Cregger
Central Michigan University

Joseph Ekstrom
Brigham Young University

Rob Friedman
NJIT

Gregory Hislop
Drexel University

Rick Homkes
Purdue University

Bill Paterson
Mount Royal University

Terry Steinbach
DePaul University

Michael Stinson
Central Michigan University
In this tag cloud of SIGITE 2011 reviewers the size of the name corresponds to the number of reviews that reviewer completed. The program committee would like to thank all of our reviewers and especially thanks those reviewers who reviewed more than the median and those dedicated emergency reviewers who stepped in at the last moment to review one or two extra papers under tight time constraints.
REVIEWERS

Mahir Ali, University of Sharjah
Hend Al-Khalifa, King Saud University
Fatima Al-Raisi, Sultan Qaboos University
Jose Antonio Alvarez-Bermejo, Universidad de Almeria
Alethe Bailey, Newman University College
Dianne Bills, Rochester Institute of Technology
Larry Booth, Clayton State University
Lynn Braender, The College of New Jersey
Jeff Brewer, Purdue University
Wayne Brookes, University of Technology, Sydney
William Burkett, Capella University
Rob Byrd, Abilene Christian University
Yu Cai, Michigan Technological University
Jean Coppola, Pace University
Monica Costa, Instituto Politecnico de Castelo Branco
Amanda Debler, DIS AG
Nalaka Edirisinghe, Temasek Polytechnic
Joseph Ekstrom, Brigham Young University
Stefano Federici, Università di Cagliari
Alan Fedoruk, Mount Royal University
Allan Fowler, Waiairiki Institute of Technology
Robert Friedman, NJIT
Daniel Garrison, George Mason University
Rick Gee, Okanagan College
Kathy Gill, University of Washington
Sylvie Girard, Université du Maine & University of Bath
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Mingwei Gong, Mount Royal University
Prakash Goteti, Mahindra Satyam
Thomas Hacker, Purdue University
Richard Helps, BYU
Gregory Hislop, Drexel University
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Rick Homkes, Purdue University
Sudharsan Iyengar, Winona State University
Hetal Jasani, Northern Kentucky University
Michael Jonas, UNH Manchester
Harshad Joshi, Indiana University
Cem Kaner, Florida Tech
Shakeel Khoja, Institute of Business Administration
Steven Kollmansberger, South Puget Sound Community College
Angela Lemons, NC A&T State University
Jim Leone, RIT
Chengcheng Li, East Carolina University
Barry Lunt, Brigham Young University
Stefan Mangold, Disney Research Zurich
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Susan Miertschin, University of Houston
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Trudi Miller, University of Wisconsin-Stevens Point
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Junfeng Qu, Clayton State University
Hugo Rehesaar, Griffith University
Han Reichgelt, Southern Polytechnic State University
Janet Renwick, University of Arkansas - Fort Smith
Charles Reynolds, U.S. Military Academy
Dale Rowe, Brigham Young University
Etienne Schneider, University for Information Science and Technology – Ohrid
Amber Settle, DePaul University
Edward Sobiesk, United States Military Academy
Theresa Steinbach, DePaul University
Adriana Steyn, University of Pretoria
Mark Stockman, University of Cincinnati
Leigh Ann Sudol, Carnegie Mellon University
Andrew Suhy, University of Michigan
Bob Sweeney, University of South Alabama
Maciej Syslo, Nicolaus Copernicus University
Sue Talley, Capella University

Suleyman Uludag, University of Michigan - Flint
Faith-Michael Uzoka, Mount Royal University
Janice Warner, Georgian Court University
Linda Webster, Westminster College
Patricia Wheeler, SUNY Empire State College
Deborah Whitfield, Slippery Rock University
Glenn Wilson, University of Southern Maine
Janifer Winter, University of Hawaii
James Woolen, Ferris State University
Daniel Yoas, Pennsylvania College of Technology
Dongqing Yuan, UW-Stout
Chi Zhang, Southern Polytechnic State University
### OVERVIEW

#### Wednesday October 19

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 pm — 4:00 pm</td>
<td><strong>IT Department Chairs Meeting</strong></td>
<td>Bradley</td>
</tr>
<tr>
<td>3:00 pm — 6:00 pm</td>
<td><strong>Registration</strong></td>
<td>Thayer Hotel Lobby</td>
</tr>
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#### Thursday October 20

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>7:30 am — 10:00 am</td>
<td><strong>Executive Committee Meeting</strong></td>
<td>Bradley</td>
</tr>
<tr>
<td>8:00 am — 10:00 am</td>
<td><strong>Registration</strong></td>
<td>Thayer Hotel Lobby</td>
</tr>
<tr>
<td>10:00 am — 10:30 am</td>
<td><strong>Opening Session</strong></td>
<td>Grant Ballroom</td>
</tr>
<tr>
<td>10:30 am — 10:55 am</td>
<td><strong>Paper Session 1</strong> Advising</td>
<td>Bradley</td>
</tr>
<tr>
<td>10:30 am — 10:55 am</td>
<td><strong>Paper Session 2</strong> Open Source</td>
<td>Grant Ballroom</td>
</tr>
<tr>
<td>10:55 am — 11:20 am</td>
<td><strong>Management, Structures and Tools to Scale up Personal Advising in Large Programming Courses</strong></td>
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<td><strong>Free and Open Source Software Development of IT Systems</strong></td>
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<td>11:20 am — 11:45 am</td>
<td><strong>How did Mathematics and Accounting Get So Many Women? What Can IT Disciplines Learn?</strong></td>
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<td><strong>Physics in Motion: An Interdisciplinary Project</strong></td>
<td>Grant Ballroom</td>
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<tr>
<td>11:45 am — 12:15 pm</td>
<td><strong>Panel 1</strong> Recruiting Women in IT</td>
<td>Bradley</td>
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<tr>
<td>11:45 am — 12:15 pm</td>
<td><strong>Panel 2</strong> Open Source Software</td>
<td>Grant Ballroom</td>
</tr>
<tr>
<td>12:15 pm — 1:00 pm</td>
<td><strong>Lunch</strong></td>
<td>Washington Ballroom</td>
</tr>
<tr>
<td>1:00 pm — 1:25 pm</td>
<td><strong>Paper Session 3</strong> Outreach</td>
<td>Bradley</td>
</tr>
<tr>
<td>1:00 pm — 1:25 pm</td>
<td><strong>Paper Session 4</strong> Using Games in IT</td>
<td>Grant Ballroom</td>
</tr>
<tr>
<td>1:25 pm — 1:50 pm</td>
<td><strong>Engaging High School Students in Computer Science via Challenging Applications</strong></td>
<td>Grant Ballroom</td>
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<tr>
<td>1:25 pm — 1:50 pm</td>
<td><strong>Computational Thinking in a Game Design Course</strong></td>
<td>Grant Ballroom</td>
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<tr>
<td>1:50 pm — 2:15 pm</td>
<td><strong>A Novel Junior Transition Course for Students of Applied Information Technology</strong></td>
<td>Grant Ballroom</td>
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<tr>
<td>1:50 pm — 2:15 pm</td>
<td><strong>Motivations and Informing Frameworks of Game Degree Programs in the United Kingdom and the United States</strong></td>
<td>Grant Ballroom</td>
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<tr>
<td>2:15 pm — 2:30 pm</td>
<td><strong>Introductory Computing Course Content: Educator and Student Perspectives</strong></td>
<td>Grant Ballroom</td>
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<tr>
<td>2:15 pm — 2:30 pm</td>
<td><strong>Engaging Game Design Students Using Peer Evaluation</strong></td>
<td>Grant Ballroom</td>
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<tr>
<td>2:15 pm — 2:30 pm</td>
<td><strong>Break</strong></td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Paper Session 5</th>
<th>Paper Session 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:30 pm — 2:55 pm</td>
<td>Applying CPR to the Teaching of IT Ethics</td>
<td>Integrating Mobile Web Development into IT curriculum</td>
</tr>
<tr>
<td>2:55 pm — 3:20 pm</td>
<td>A Student’s Perspective on The Importance of Teaching Social Issues in the I.T. Curriculum</td>
<td>Teaching Web Development at a Distance</td>
</tr>
<tr>
<td>3:30 pm — 4:00 pm</td>
<td><strong>Panel 3</strong>&lt;br&gt;Service Learning&lt;br&gt;Location: Bradley</td>
<td><strong>Panel 4</strong>&lt;br&gt;CSTA National Standards&lt;br&gt;Location: Grant Ballroom</td>
</tr>
<tr>
<td>4:30 pm — 6:00 pm</td>
<td><strong>Cadet Tour</strong></td>
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<tr>
<td>6:00 pm — 7:30 pm</td>
<td><strong>Dinner</strong>&lt;br&gt;Location: Robinson Auditorium (3rd floor Thayer Hall)</td>
<td></td>
</tr>
<tr>
<td>7:45 pm — 8:45 pm</td>
<td><strong>Keynote Speaker</strong>&lt;br&gt;Dave Ferrucci, IBM Research&lt;br&gt;Location: Robinson Auditorium</td>
<td></td>
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### Friday October 21

<table>
<thead>
<tr>
<th>Time</th>
<th>Paper Session 7</th>
<th>Paper Session 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 am — 8:30 am</td>
<td><strong>Continental Breakfast</strong>&lt;br&gt;Location: Foyer</td>
<td></td>
</tr>
<tr>
<td>8:30 am — 8:55 am</td>
<td><strong>Paper Session 7</strong>&lt;br&gt;Networking and Security&lt;br&gt;Location: Bradley</td>
<td><strong>Paper Session 8</strong>&lt;br&gt;Pedagogy and Assessment&lt;br&gt;Location: Grant Ballroom</td>
</tr>
<tr>
<td>8:30 am — 8:55 am</td>
<td>Bringing together a Low-Cost Networking Learning Environment</td>
<td>An Assessment Framework for Identifying Information Technology Bachelor Programs</td>
</tr>
<tr>
<td>8:55 am — 9:20 am</td>
<td>Developing IP Telephony Laboratory and Curriculum with Private Cloud Computing</td>
<td>A Competency Based Approach to Developing Articulation Agreements in Computing</td>
</tr>
<tr>
<td>9:20 am — 9:45 am</td>
<td>The Role of Cyber-Security in Information Technology Education</td>
<td>Computing Faculty Tenure and Promotion Requirements at U.S. and Canadian Post-Secondary Institutions</td>
</tr>
<tr>
<td>9:45 am — 10:15 pm</td>
<td><strong>Break</strong>&lt;br&gt;Location: Foyer</td>
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<tr>
<td>9:45 am — 10:15 pm</td>
<td><strong>Poster Session</strong>&lt;br&gt;Location: Hap Arnold Room</td>
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<tr>
<td>10:15 am — 10:40 am</td>
<td><strong>Paper Session 9</strong>&lt;br&gt;IT Curriculum&lt;br&gt;Location: Bradley</td>
<td><strong>Paper Session 10</strong>&lt;br&gt;Online Environments&lt;br&gt;Location: Grant Ballroom</td>
</tr>
<tr>
<td>10:15 am — 10:40 am</td>
<td>Even so with the pieces borrowed from others: Dressing an IS program in IT clothing</td>
<td>The Georgia WebBSIT: Profile of an Online Student Reexamined</td>
</tr>
<tr>
<td>10:40 am — 11:05 am</td>
<td>Informatics Minor for Non-Computing Students</td>
<td>Impact of Student Training on the Perceived Ease of Use and Ease of Navigation of a Learning Management System</td>
</tr>
<tr>
<td>11:05 am — 11:30 am</td>
<td>The 2+2 Bachelor of Applied Science in Information Technology Follow-up 2 years Later - Dealing With Challenges</td>
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<tr>
<td>Time</td>
<td>Event</td>
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</tbody>
</table>
| 11:30 am — 12:15 pm | **Vendor Session**  
EMC  
Location: Bradley  
Transforming Information Technology Curricula with Innovative Storage & Data Management Teaching Resources |
| 12:15 pm — 1:15 pm | **Lunch**  
Location: Washington Ballroom |
| 12:15 pm — 1:15 pm | **Lunch Speaker**  
Suzanne Westbrook, National Science Foundation  
Location: Washington Ballroom |
| 1:15 pm — 1:40 pm | **Paper Session 11**  
Databases and Cloud Computing  
Location: Bradley  
SAVI: A new system for Advanced SQL Visualization |
| 1:40 pm — 2:05 pm | **Paper Session 12**  
Approaches to Intro Programming  
Location: Grant Ballroom  
Implementing IT0/CS0 with Scratch, App Inventor for Android, and Lego Mindstorms |
| 2:05 pm — 2:30 pm | **Paper Session 13**  
Tools and Environments  
Location: Bradley  
Introducing Cloud Computing with a Senior Design Project in Undergraduate Education of Computer System and Network Administration |
| 2:30 pm — 2:45 pm | **Break**  
Location: Foyer |
| 2:45 pm — 3:10 pm | **Paper Session 14**  
Unique Courses  
Location: Grant Ballroom  
Teaching Enterprise Application Development: Strategies and Challenges |
| 3:10 pm — 3:35 pm | **Paper Session 13**  
Databases and Cloud Computing  
Location: Bradley  
Visualizing the Modern Operating System: Simulation Experiments Supporting Enhanced Learning |
| 3:35 pm — 4:00 pm | **Paper Session 14**  
Unique Courses  
Location: Grant Ballroom  
Teaching Natural User Interaction Using OpenNI and the Microsoft Kinect Sensor |
| 4:30 pm — 7:00 pm | **Hudson River Tour and Dinner**  
Location: Hudson River |
<table>
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<tr>
<td>8:00 am – 8:30 am</td>
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<td>Location: Foyer</td>
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<tr>
<td>8:30 am – 8:55 am</td>
<td><strong>Paper Session 15</strong>&lt;br&gt;IT in the Health Domain&lt;br&gt;Location: Bradley</td>
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<tr>
<td>8:30 am – 8:55 am</td>
<td><strong>Paper Session 16</strong>&lt;br&gt;IT Research&lt;br&gt;Location: Grant Ballroom</td>
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<tr>
<td></td>
<td>A Health IT Application Domain Course for a Traditional IT Program</td>
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<td>A Multi-layer Tree Model for Enterprise Vulnerability Management</td>
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<tr>
<td>8:55 am – 9:20 am</td>
<td><strong>Paper Session 17</strong>&lt;br&gt;Capstone Courses&lt;br&gt;Location: Bradley</td>
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<tr>
<td>8:55 am – 9:20 am</td>
<td><strong>Paper Session 18</strong>&lt;br&gt;Student Research&lt;br&gt;Location: Grant Ballroom</td>
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<tr>
<td></td>
<td>Information Technology for Continuous Patient Health Education</td>
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<td></td>
<td>A Solace in Quantum</td>
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<tr>
<td></td>
<td>A Trust-Aware Tag-Based Privacy Control for eHealth 2.0</td>
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<td>Measuring the performance of VoIP over Wireless LAN</td>
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<tr>
<td>9:45 am – 10:10 pm</td>
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<td><strong>Paper Session 18</strong>&lt;br&gt;Student Research&lt;br&gt;Location: Grant Ballroom</td>
</tr>
<tr>
<td>10:10 am – 10:35 am</td>
<td>Capstone Experience – Lessons from an Undergraduate Research Group in Speech at UNH Manchester</td>
</tr>
<tr>
<td>10:10 am – 10:35 am</td>
<td>Do students have the relevant ICT skills they need to do their research projects?</td>
</tr>
<tr>
<td>10:35 am – 11:00 am</td>
<td>Effects of Communication, Leadership, and Team Performance on Successful IT Capstone Projects: A Case Study</td>
</tr>
<tr>
<td>10:35 am – 11:00 am</td>
<td>Enhancing Network Security Education with Research and Development Content</td>
</tr>
<tr>
<td>11:00 am – 11:30 pm</td>
<td><strong>Panel 5</strong>&lt;br&gt;Accreditation and Assessment&lt;br&gt;Location: Grant Ballroom</td>
</tr>
<tr>
<td>11:30 am – 12:00 pm</td>
<td><strong>Closing Session</strong>&lt;br&gt;Location: Grant Ballroom</td>
</tr>
<tr>
<td>12:00 pm – 1:00 pm</td>
<td><strong>Executive Committee Meeting</strong>&lt;br&gt;Location: MacArthur’s Restaurant</td>
</tr>
</tbody>
</table>
Opening Session

Thursday Oct 20, 10:00am — 10:30am
Room: Grant Ballroom

Bryan Goda and Eduard Sobiesk, United States Military Academy
Randy Connolly, Mount Royal University
Mark Stockman, University of Cincinnati

Paper Session 1 - Advising

Thursday Oct 20, 10:30am — 11:45am
Room: Bradley
Session Chair: Janet Renwick, University of Arkansas - Fort Smith

Management, Structures and Tools to Scale up Personal Advising in Large Programming Courses
Arto Vihavainen, University of Helsinki
Jaakko Kurhila, University of Helsinki

We see programming in higher education as a craft that benefits from a direct contact, support and feedback from people who already master it. We have used a method called Extreme Apprenticeship (XA) to support our CS1 education. XA is based on a set of values that emphasize actual programming along with current best practices, coupled tightly with continuous feedback between the advisor and the student. As such, XA means one-on-one advising which requires resources. However, we have not used abundant resources even when scaling up the XA model. Our experiments show that even in relatively large courses (n = 192 and 147), intensive personal advising in CS1 does not necessarily lead to more expensive course organization, even though the number of advisor-evaluated student exercises in a course grew from 252 to 17420. A thorough comparison of learning results and organizational costs between our traditional lecture/exercise-based course model and XA-based course model is presented.

Rethinking Advising: Developing a Proactive Culture to Improve Retention
Amber Settle, DePaul University
John Glatz, DePaul University

In 2009 DePaul University’s College of Computing and Digital Media (DePaul CDM) discovered a significant lag in undergraduate retention rates as well as four, five and six-year graduation rates as compared to other major colleges at the university. DePaul CDM’s investment in online student service resources had over time caused the unintentional reinvention of the college advising office into one that supported a very limited number of students, focusing primarily on students either in academic distress or students nearing graduation. In an effort to modify the advising culture at DePaul CDM into a more proactive one, a strategic student service plan was formulated, with the goal of addressing issues related to retention and graduation. We describe early successes and failures in changing the approach to student advising and provide information about future initiatives and evaluation.

How did Mathematics and Accounting Get So Many Women? What Can IT Disciplines Learn?
Ruth Guthrie, California State Polytechnic University, Pomona
Elaine Yakura, Michigan State University
Louise Soe, California State Polytechnic University, Pomona

This paper looks at two disciplines with similarities to Information Technology (IT) to see if any differences inform what should be done in IT to attract and retain women students. Disciplines that were traditionally male, mathematics and accounting, have succeeded in gaining equal numbers of male and female students. An overview of the gender transformation of Math and Accounting is given, with a list of shared strategies used to attract women. Similarities to the IT discipline are discussed and prescriptions for attracting women to IT are given.
Paper Session 2 — Open Source

Thursday Oct 20, 10:30am — 11:45am
Room: Grant Ballroom
Session Chair: Barry Lunt, Brigham Young University

Learning in the GNU/Linux Community
Donald Davis, University of Texas at San Antonio
Iffat Jabeen, University of Texas at San Antonio

The GNU/Linux operating system was born from the Linux kernel developed by Linus Torvalds and GNU software packages developed by Richard Stallman and others at the GNU project. GNU/Linux quickly blossomed and has become a successful OS with a community of more than five million users and developers. The GNU/Linux paradigm encourages a sense of community and participation, building upon shared knowledge. The same tenets of collaboration and shared knowledge are espoused by academia and the educational system. Therefore, researchers conducted an online survey to examine the learning practices of the GNU/Linux community and to determine whether the GNU/Linux community might be considered a participatory learning community.

Free and Open Source Software Development of IT Systems
Mihaela Sabin, University of New Hampshire

IT system development, integration, deployment, and administration benefit significantly from free and open source software (FOSS) tools and services. Affordability has been a compelling reason for adopting FOSS in computing curricula and equipping computing labs with support infrastructure. Using FOSS, however, is just the first step in taking advantage of how FOSS principles and practices can impact student learning in IT degree programs. Above all, FOSS IT system development requires changes to how students, instructors, and other contributors work collaboratively and openly and get involved and invested in project activities. In this paper I examine the challenges to engage students in FOSS projects that benefit real clients.

Physics in Motion: An Interdisciplinary Project
Debra Smarkusky, Penn State Worthington Scranton
Stanley Stancavage, Penn State Worthington Scranton
Ryan Eagan, Penn State Worthington Scranton
Preston Propert, Penn State Worthington Scranton
Raymond Plociniak, Penn State Worthington Scranton
Andrew Nichols, Penn State Worthington Scranton

Students in computer science and information technology should be engaged in solving real-world problems received from government and industry as well as those that expose them to various areas of application. This paper summarizes the results of an undergraduate research project between students in the Department of Information Sciences and Technology (IST) and the Department of Physics. Students were provided with a copy of Satellite Tool Kit®, a commercial software product, and asked to complete research and development tasks based on the concepts learned in a distributed computing course. This interdisciplinary and collaborative effort provided challenges, lessons learned and positive experiences for future development.
Panel 1 — Recruiting and Retaining Women in Information Technology

Thursday Oct 20, 11:45 am – 12:15am
Room: Bradley

Cynthia Riemenschneider, Baylor University
Theresa Steinbach, DePaul University
Janet S. Renwick, University of Arkansas - Fort Smith

At a time when demand for graduates in computing is increasing, the number of majors, particularly women, has significantly decreased.

The US Bureau of Labor Statistics projects that jobs in computer and mathematical sciences will grow “more than twice as fast as the average for all occupations in the economy” from 2008 through 2018 (BLS, 2010). At the same time, studies found that women are approximately 2.5 times more likely to leave IT than men (Wardell et al., 2005; 2006).

This panel will discuss ways to recruit women into our majors as well as factors that have been shown to contribute to them leaving the IT profession. By identifying these factors, hopefully we can address the issues raised and encourage women to stay in information technology.

Developing tomorrow’s information storage professionals . . . today!

The EMC Academic Alliance, a collaboration with colleges and universities worldwide, was created to address the skills gap resulting from the growing volume and complexity of data. This sharp increase in data creation and the heightened importance of storing, protecting and managing, has elevated information storage as a central function of the IT infrastructure.

There is no cost to institutions to join the EMC Academic Alliance. As part of the program, EMC offers the unique “open” Information Storage and Management (ISM) curriculum to academic institutions. This curriculum focuses on concepts and principles of information storage technologies, rather than on specific products. Members receive numerous benefits including: faculty training, course materials, and secure web portals for faculty and students.

For more information visit http://education.emc.com/academicalliance
OR contact us at Academic_Alliance_Program_Office@emc.com.
Panel 2 — Open Source Software in Computing Education

Thursday Oct 20, 11:45 am — 12:15am
Room: Grant Ballroom

Stephen Jacobs, Rochester Institute of Technology
Clif Kussmaul, Muhlenberg College
Mihaela Sabin, University of New Hampshire

Free and Open Source Software (FOSS) exemplifies the merit and successes of open content, understood broadly as creative work that explicitly allows sharing and further changes by anyone, whether an individual or organization. Although the benefits of improving computing education with open source practices are largely acknowledged, transforming teaching to create effective learning environments has many challenges. The panelists will bring different perspectives on teaching strategies and curricular content they have used in their classrooms. These perspectives will exemplify key issues with FOSS-based education and FOSS-based IT systems. The developer and user communities established around FOSS-based IT systems are of particular interest to the IT discipline because of its focus on user centeredness and advocacy for advancing professional practices in authentic environments.
Engaging High School Students in Computer Science via Challenging Applications

Giuseppe Maggiore, Università Ca’ Foscari di Venezia
Andrea Torsello, Università Ca’ Foscari di Venezia
Flavio Sartoretto, Università Ca’ Foscari di Venezia
Agostino Cortesi, Università Ca’ Foscari di Venezia

How do we encourage high school students to choose a computer science degree? In this paper we describe a general framework for building short-courses designed to engage student while presenting a sub-field of computer science. We also describe two of these short-courses centered around computer graphics and physical simulations. We take advantage of the ease with which computer science allows even beginner students to apply and experiment with their knowledge thanks to interactive environments.

A Novel Junior Transition Course for Students of Applied Information Technology

Pelin Aksoy, George Mason University

An overview of a new junior transition course offered to undergraduate students in the Bachelor of Science in Applied Information Technology is presented. The main objective of the course is to guide students to make informed decisions when choosing an area of focus that best suits their interest and abilities. Other aspects include providing general information on the program, ensuring that students get the proper advising that they need, bringing awareness to the career paths available within each concentration area, informing students of the options they have available for completing minors, second majors as well as graduate studies. Other important issues such as insights into the senior design project experience, certifications, and school resources are also discussed. Results from two semesters of teaching the course both online and in-class indicate positive outcomes and encouraging results with more favorable effects achieved in the classroom setting.

Introductory Computing Course Content: Educator and Student Perspectives

Joseph Elarde, Upper Iowa University
Fatt-Fei Chong, Upper Iowa University

Selecting the appropriate content for introductory computing courses is an important part of attracting and retaining students in computer related education programs. This paper reports the results of an educator survey including SIGCSE and SIGITE members designed to evaluate topics that member institutions currently include and would prefer to include in their introductory computing courses notably for non-majors. In addition, we contrast information obtained from the educator surveys to a student preference survey and student outcome evaluations from our introductory computing course. In this paper we show how the perspectives of computer science and information technology educators differ with regard to content of their courses and the differences between the currently offered content and what would be preferred. We also examine survey respondent perspectives regarding the teaching of the office suite, broadening participation, and interdisciplinary topics.
Computational Thinking in a Game Design Course
Amber Settle, DePaul University

As a part of an NSF-funded project to enhance computational thinking in undergraduate general education courses, activities and assessments were developed for a game design course taught at DePaul University. The focus of the course is on game analysis and design, but the course textbook uses an approach that is heavily grounded in computational thinking principles. We describe the course activities and assignments and discuss an initial assessment of those materials. Our results show that there is a gap in difficulty between several of the activities and indicate that the materials developed help students to better learn the computational thinking concepts in the course.

Motivations and Informing Frameworks of Game Degree Programs in the United Kingdom and the United States
Monica McGill, Bradley University

The rise of games in the marketplace has resulted in a birth of a number of academic institutions establishing game degree programs. These programs vary and their bent may be entirely technical, like those based on a more traditional computer science program, or may be less technical and more focused on design and creativity. Unlike more established fields where information sharing is the norm, the newness of game degree programs means there is less information to guide faculty during the curriculum planning process. Further, though there has been much speculation about why these programs have been created, there is no formal research that explores the motivation behind establishing programs. This study employed an explanatory mixed methods design to examine methods institutions used to inform their creation of these programs. The results provide important groundwork for educational researchers to consider when further examining the curriculum planning process for game degree programs.

Engaging Game Design Students Using Peer Evaluation
Amber Settle, DePaul University
Charles Wilcox, DePaul University
Chad Settle, University of Tulsa

Many information technology educators have worked in recent years to develop courses to attract students to the field. As faculty achieve success with technical courses designed to be appeal to a broad audience, it can be hard to maintain the initial excitement particularly as multiple sections of the courses are taught on a continuing basis. In this article we describe a project that added peer evaluation to an assessment in a game design course with a large non-major audience. While controversial, peer evaluation has shown some promise in motivating students to work harder and in improving certain key skills. Consistent with other studies in areas outside of game design, the introduction of peer evaluation showed significant improvement in student engagement.
Paper Session 5 — Ethics and Social Issues

**Applying CPR to the Teaching of IT Ethics**

*Rick Homkes, Purdue University  
Robert Strikwerda, Saint Louis University*

An approach typical of philosophers teaching introductory ethics is to immediately introduce students to competing theories and approaches. Unfortunately, this approach has the risk of bewildering students and occupying much course time. Conversely, using an artificially narrowed and prescribed approach to teaching IT ethics such as professional codes of ethics or historical case studies does not do justice to the topic or to the students. Here the student may end up with a good appreciation of codes or cases, but little grounding in philosophical thought. In seeking a middle ground, we suggest a simplified framework that captures important elements of multiple ethical theories while still allowing students to use a unitary conceptual framework in ethical decision-making. This approach, conveniently labeled the CPR Framework, includes the three elements of Character, Principles, and Results. This framework can be used by students both in class and later in their professional careers.

**A Student’s Perspective on The Importance of Teaching Social Issues in the I.T. Curriculum**

*Fahad Zaidi, Mount Royal University*

With the rapid growth and popularity of information technology in our society, societal issues as they pertain to IT have become a key component of the IT model curriculum. Mount Royal University offers a course titled ‘Information Technology and Society’ which enables students to gain an understanding about how the technology they use affects society as a whole in positive and negative manners. This paper provides a student’s perspective on the effectiveness of this course. In addition, this paper provides the argument for the incorporation of a dedicated course on social issues pertaining to technology in IT curriculums.
Paper Session 6 — Web Development

Thursday Oct 20, 2:30pm — 3:20pm
Room: Grant Ballroom
Session Chair: Jim Leone, RIT

Integrating Mobile Web Development into IT curriculum
Hend Al-Khalifa, King Saud University
Nora Al-Rajebah, King Saud University

Recently, the use of mobile phones to access the web has increased exponentially. This technological shift has created a growing demand for mobile website developers in the IT market. To reflect on this recurring demand, the skills taught for an IT undergraduate in a web related course need to take this topic into consideration. In this paper we present our experience in implementing a module on mobile website design and development in an advanced web technologies course. We also report the results obtained from implementing the module in terms of students’ feedback and final remarks.

Teaching Web Development at a Distance
Ye Diana Wang, George Mason University

Distance education (DE) is proliferating with no signs of slowing down. This paper aims to fill the gap of lacking literature by providing instructional details of teaching a Web development course in the format of asynchronous DE and offering practical instructional strategies. The unique contribution of this paper lies in exemplifying the online delivery of a highly technical course that has been traditionally taught in face-to-face settings, as well as the application of problem-based learning (PBL) methods to DE.

Panel 3 - Community Empowering Service-Learning (SL) Courses Through 21st Century Technologies

Thursday Oct 20, 3:30pm — 4:00pm
Room: Bradley

Susan Feather-Gannon, Pace University
James Lawler, Pace University
Pauline Mosley, Pace University
Jean F. Coppola, Pace University

This panel will include a historical perspective of IT service-learning (SL) courses at a multi-campus university followed by specific descriptions of the challenges and rewards of designing and facilitating courses that foster civic engagement. The courses covered will include the earliest course in the SL repertoire, Computers for Human Empowerment, and a course that helps higher-functioning (less impaired) computer science high school students with disabilities in learning advanced technology skills and life planning and personal productivity skills where assistive communication devices are tailored to each student. Also included will be a discussion of Problem Solving Using LEGO Robotics in which robotics technology is being integrated into science and technology (STEM) courses at the New York School for the Deaf. Intergenerational Computing, which was showcased on CBS News recently, will be highlighted in this panel discussion.
Panel 4 - CSTA National Standards and their Impact on the Future of K-12 Computer Education

Thursday Oct 20, 3:30pm — 4:00pm
Room: Bradley

Brian Fuschetto, Computer Science Teachers Association
Anita Verno, Bergen Community College
Brian Fuschetto, Lyndhurst High School / Bergen Community College
Fran Trees, Drew University

The Computer Science Teachers Association (CSTA), a membership organization that supports and promotes the teaching of computer science and other computing disciplines, recently revised the Model Curriculum for K-12 Computer Science with a focus on establishing National K-12 Computer Science Education Standards. The intent of the document is to provide teachers, schools, districts, states, and governing bodies with a framework upon which to enhance and facilitate computer education in K-12 schools. The panel will discuss how the revised standards will impact K-12 education and discuss the ways in which educators at all levels (K through College) can help to strengthen computer studies programs in our nation’s schools. The panel will present information about the revised Model, the role of the CSTA, and the reality of K-12 computer education today. Time will be allotted for discussion and sharing of ideas for making K-12 computer education a reality for all students.

Cadet Tour

Thursday Oct 20, 4:30pm — 6:00pm
Parade Ground
Thursday — October 20 — Program Details

Dinner

Thursday Oct 20, 6:00pm — 7:30pm
Robinson Auditorium (3rd Floor Thayer Hall)

http://upload.wikimedia.org/wikipedia/commons/2/22/IBM_Watson.PNG

Keynote - Building Watson: An Overview of the DeepQA Project

Thursday Oct 20, 7:45pm – 8:45pm
Robinson Auditorium (3rd Floor Thayer Hall)

David Ferrucci, IBM Fellow and Watson Principal Investigator (IBM Research)

Computer systems that can directly and accurately answer peoples’ questions over a broad domain of human knowledge have been envisioned by scientists and writers since the advent of computers themselves. Open domain question answering holds tremendous promise for facilitating informed decision making over vast volumes of natural language content. Applications in business intelligence, healthcare, customer support, enterprise knowledge management, social computing, science and government could all benefit from computer systems capable of deeper language understanding. The DeepQA project is aimed at exploring how advancing and integrating Natural Language Processing (NLP), Information Retrieval (IR), Machine Learning (ML), Knowledge Representation and Reasoning (KR&R) and massively parallel computation can greatly advance the science and application of automatic Question Answering. An exciting proof-point in this challenge was developing a computer system that could successfully compete against top human players at the Jeopardy! quiz show (www.jeopardy.com).

Attaining champion-level performance at Jeopardy! requires a computer to rapidly and accurately answer rich open-domain questions, and to predict its own performance on any given question. The system must deliver high degrees of precision and confidence over a very broad range of knowledge and natural language content with a 3-second response time. To do this, the DeepQA team advanced a broad array of NLP techniques to find, generate, evidence and analyze many competing hypotheses over large volumes of natural language content to build Watson (www.ibmwatson.com). An important contributor to Watson’s success is its ability to automatically learn and combine accurate confidences across a wide array of algorithms and over different dimensions of evidence. Watson produced accurate confidences to know when to “buzz in” against its competitors and how much to bet. High precision and accurate confidence computations are critical for real business settings where helping users focus on the right content sooner and with greater confidence can make all the difference. The need for speed and high precision demands a massively parallel computing platform capable of generating, evaluating and combing 1000’s of hypotheses and their associated evidence. In this talk, I will introduce the audience to the Jeopardy! Challenge, explain how Watson was built on DeepQA to ultimately defeat the two most celebrated human Jeopardy Champions of all time and I will discuss applications of the Watson technology beyond in areas such as healthcare.
Friday — October 21 — Program Details

**Paper Session 7 — Networking and Security**

**Friday Oct 21, 8:30am — 9:45am**
Room: Bradley
Session Chair: Suleyman Uludag, University of Michigan - Flint

**Bringing together a Low-Cost Networking Learning Environment**
Steve Cosgrove, Whitireia New Zealand

There are many challenges typically encountered by a tertiary institution setting up applied networking resources. Such labs are necessary to create industry-ready graduates. Smaller institutes face particular issues where they lose the benefit of economies of scale. This is because networking resources usually scale particularly well as the number of users increases. This paper considers a wide range of factors that show how a ‘Learning Environment’ is far more than just a computer network. This paper describes a range of elements of the Learning Environment. Each is described fully, then put into context of an overall, ‘living’ environment of many different aspects. There is consideration of a recent, and very exciting, addition to the Environment, then a look at the crystal ball of future directions, and mirror of lessons learned. This paper will contain information useful to anyone managing an applied network lab, or a wider environment for teaching Information Technology courses.

**Developing IP Telephony Laboratory and Curriculum with Private Cloud Computing**
Yuan Dongqing, University of Wisconsin-Stout
Lewandowski Cody, University of Wisconsin-Stout
Zhong Jiling, Troy University

Internet Protocol (IP) Telephony is growing rapidly in the telecommunication industry. Since IP Telephony curriculum is very new to IT education and also because of the high cost of laboratory equipment, there are very few universities that offer IP Telephony courses. The documentation on IP Telephony laboratory and curriculum is also under-developed. To meet the challenges of this new technology and the needs of IT students, in this paper, we explore how an IT Telephony laboratory can be built upon within the private cloud to serve the class. We believe the lectures and hands-on experience provided by an IP Telephony course help the students gain the knowledge and skills in the areas of configuring an IP Telephony system. This research can serve as a reference guide for other IT educators who want to deploy IP Telephony laboratory and curriculum in their institutions.

**The Role of Cyber-Security in Information Technology Education**
Dale Rowe, Brigham Young University
Barry Lunt, Brigham Young University
Joseph Ekstrom, Brigham Young University

This paper discusses the role of cyber-security in an IT education context and explains why IT programs should champion this topic. The relationship between Information Assurance and Security as a currently recognized discipline within IT and advanced cyber-security topics are presented. Recommendations for the placement and structure of a cyber-security emphasis within a curriculum are presented using an adaptable framework that we have named “Prepare, Defend, Act”. We rationalize and discuss this framework along with teaching methods we have found to be effective in helping students maximize their cyber-security learning experience. Finally, four recommendations are proposed that we invite IT program-offering institutions to review.
An Assessment Framework for Identifying Information Technology Bachelor Programs

Dale Rowe, Brigham Young University
Barry Lunt, Brigham Young University
Richard Helps, Brigham Young University

What is an IT Bachelor program and how can one be identified? The ACM has recommended approved minimum requirements for IT undergraduate curriculum since 2008. ABET has been accrediting programs offering IT majors since 2006. However, IT programs have been hard to identify for several reasons. They are not always titled “Information Technology”. They are housed in various colleges and schools – such as engineering, business, computing, and information science. Also, they may not have associated themselves with ABET or ACM so these programs may not be accredited. We have undertaken research that uses the ACM IT 2008 model curriculum to identify the “fit” between those minimum criteria and published university undergraduate curriculum regardless of the title, college, or professional association of the program. This paper will present the criteria we propose to use as we attempt to identify all the 4-year IT programs in the USA.

A Competency Based Approach to Developing Articulation Agreements in Computing

Daniel Yoas, Pennsylvania College of Technology
Sandra Gorka, Pennsylvania College of Technology
Jacob Miller, Pennsylvania College of Technology

Projected enrollment in Pennsylvania high schools is expected to continue to decline over the next 10 to 15 years. Additionally, current economic and budget constraints are encouraging students to consider community colleges as the beginning of their baccalaureate degree programs. This increases the pressure on four-year colleges and universities to increase their recruiting efforts to attract community college transfer students. Articulation agreements are the traditional mechanism used to define and formalize the transfer process. In this paper we discuss a process for creating articulation agreements that expands the scope of programs transferring into a four-year degree. In particular we will discuss the effort to recruit students into a four-year Information Assurance and Security program. We will discuss the development of the methodology, the process currently used by the college for developing agreements, and the results of the effort.

Computing Faculty Tenure and Promotion Requirements at U.S. and Canadian Post-Secondary Institutions

Monica McGill, Bradley University
Amber Settle, DePaul University

In this study, we address the question of what tenure and promotion requirements for computing faculty exist at U.S. and Canadian institutions. Via a survey sent to approximately 7500 computing faculty at the 256 institutions on the Forsythe list that forms the basis of the annual Taulbee Survey, we examined characteristics of and differences in promotion and tenure requirements at U.S. and Canadian institutions. Our results identify several hidden tenure/promotion requirements that can be important for computing faculty to know. Our results also show significant differences in requirements for the number of publications, venue ranking and scope, refereed conferences and non-refereed journals, and collaborative publications and grants across various types of institutions. This work provides a basis for further study of whether faculty receive support congruent with their promotion and tenure requirements.
Posters

Friday Oct 21, 9:45am — 10:15am
Room: Hap Arnold Room

A Domain Model to Improve IT Course Design
Richard G. Helps, BYU

Applying Pair Programming for Advanced Java Course: a Different Approach
Annu Prabhakar, University of Cincinnati

Building and Utilizing an IT Data Center Lab
Chris Kadlec, Georgia Southern University
Art Gowan, Georgia Southern University

The Computational Thinking across the Curriculum Workshop
Amber Settle, DePaul University

Cyber Defense Competition: Enhancing Student Competency in Information Security
Yan Bai, University of Washington - Tacoma
Carol Taylor, Eastern Washington University

Findings from the NSF-ACM Strategic Summit on Computing Education in Community Colleges
Elizabeth Hawthorne, Union County College
Robert Campbell, CUNY Graduate Center
Posters

Friday Oct 21, 9:45am — 10:15am
Room: Hap Arnold Room

**Infrastructure-as-a-Service Clouds in a Professional Environment**

Xinli Wang, Michigan Technological University  
Christopher Bork, Michigan Technological University  
Philip Haddad, Michigan Technological University  
Matt Visich, Michigan Technological University  
Alexander Cerier, Michigan Technological University  
Brian Perrault, Michigan Technological University  
Jon Brooks, Michigan Technological University

**Introducing Virtualization Management Concepts Using Open Source Cloud Infrastructure Managers**

Peng Li, East Carolina University

**Learning Styles of Information Technology Students**

Janet S. Renwick, University of Arkansas - Fort Smith  
C. Bryan Foltz, University of Tennessee at Martin

**Parasitic Databases: An Investigation**

Svetlin Tzolov, Student - Rochester Institute of Technology  
Dianne Bills, Rochester Institute of Technology

**Social and Professional Issues: Online Naturally**

Diane Shichtman, SUNY Empire State College  
Patricia Wheeler, SUNY Empire State College

**Student IT Services to Support Open Source Software for Humanity**

Gregory Hislop, Drexel University  
Heidi Ellis, Western New England University
Paper Session 9 — IT Curriculum

Friday Oct 21, 10:15am — 11:30am
Room: Bradley
Session Chair: Charles Reynolds, U.S. Military Academy

Even so with the pieces borrowed from others: Dressing an IS program in IT clothing

Randy Connolly, Mount Royal University
Bill Paterson, Mount Royal University

This paper describes the background, the decision-making processes, and the curricular philosophy of a new four-year degree in the Computer Science & Information Systems department at Mount Royal University. The program created could be described as a hybrid between the Information Systems 2002 Model Curriculum and the Information Technology 2008 Curriculum Guidelines (IT2008). The approach described here may be of interest to other departments with existing IS programs that would like to take advantage of the strengths of the IT approach without abandoning some of the unique strengths of the IS curricula. The paper also argues that instead of trying to erect clear disciplinary boundaries around IT, we should instead think of IT as the computing discipline whose focus is the practical integration of the other computing disciplines.

Informatics Minor for Non-Computing Students

Stephen Zilora, Rochester Institute of Technology

The Rochester Institute of Technology’s School of Informatics has developed a minor in Applied Informatics that allows non-computing students from throughout the university to learn problem solving, data retrieval, and information processing and presentation skills so that they can be productive knowledge workers in the 21st century. The minor is strongly problem-oriented with students being taught how to apply deductive, inductive, and abductive reasoning, as well as fundamental information technology skills, to problems in their specific domains. It is the coursework’s relevance and applicability to the students’ majors that eases the acquisition of these skills.

The 2+2 Bachelor of Applied Science in Information Technology Follow-up 2 years Later - Dealing With Challenges

Rebecca Rutherfoord, Southern Polytechnic State University
Han Reichgelt, Southern Polytechnic State University
Ju An Wang, Southern Polytechnic State University

One of the tasks that most universities face is the problem of transfer credits for students coming from other schools. This is particularly problematic with students who attend accredited two year technical schools and receive an AAS or AAT degree. Our university created an articulation agreement with technical two year colleges who offer AAS degrees in computing fields. This paper will examine the challenges, particularly credit evaluation and advising, that have occurred over the last two years. The paper discusses the challenges and how the department has solved them.
Paper Session 10 — Online Environments

Friday Oct 21, 10:15am — 11:30am
Room: Grant Ballroom
Session Chair: Annu Prabhakar, University of Cincinnati

The Georgia WebBSIT: Profile of an Online Student Reexamined
Art Gowan, Georgia Southern University
Kam Fui Lau, Armstrong Atlantic State University
Angela Leverett, Georgia WebBSIT
Byron Jeff, Clayton State University
Wayne Summers, Columbus State University

This paper is a follow-up to a 2009 paper reporting the development of a profile of students in the Georgia Web Bachelor of Science in Information Technology (Georgia WebBSIT), a fully online baccalaureate degree program jointly developed and offered presently by six institutions within the University System of Georgia (USG). The program enrolled its first students in August 2004 and saw its first graduates in May 2008. The profile developed in 2009 was based upon demographic and performance data. The following expands the profile primarily through the use of a survey of students who have ever taken classes in the program through the report of some additional demographic data as well as perceptions. The objective is to better understand why some students are successful completing the program and why others are not.

Impact of Student Training on the Perceived Ease of Use and Ease of Navigation of a Learning Management System
Kevin McReynolds, LDS Business College

The impact of training for a new Learning Management System (LMS) was examined in this action research project. The study surveyed students (n=276) and determined that training did not affect the students’ perceived ease of use of the LMS. The time to complete the training was significantly lower (m = 35.54) than estimated (2 hours), and it was concluded that online training may not be an effective intervention to improve technology use and adoption for a younger demographic. An unanticipated result of the study was that students grossly over-reported completion of training, and this may be confirmation that survey fatigue is growing among the younger demographic. Over-reporting may be worthy of future study.
Vendor Session — EMC

Friday Oct 21, 11:30am—12:15pm
Room: Bradley

EMC Academic Alliance and Tools for Teaching the Information Storage and Management Course
Kim Yohannan, Academic Alliance Manager — EMC Corporation

Learn how you can enhance student career prospects in the world of IT through the EMC Academic Alliance program that provides the technology-based Information Storage and Management (ISM) course. This course covers information storage technologies including storage networking, business continuity, virtualization, security, and management.

In this session you will:

- Learn what the EMC Academic Alliance program has to offer members including faculty training, Instructor PPTs, product simulators, and secure web portals for faculty and students.
- Learn about 3 open source software tools (Iometer, Openfiler and FreeNAS) that faculty are using for hands-on lab activities to support the ISM course.

The EMC Academic Alliance, a collaboration with colleges and universities worldwide, was created to address the skills gap resulting from the growing volume and complexity of data. This sharp increase in data creation and the heightened importance of storing, protecting and managing, has elevated information storage as a central function of the IT infrastructure.

There is no cost to institutions to join the EMC Academic Alliance. As part of the program, EMC offers the unique “open” Information Storage and Management (ISM) curriculum to academic institutions. This curriculum focuses on concepts and principles of information storage technologies, rather than on specific products. Members receive numerous benefits including: faculty training, course materials, and secure web portals for faculty and students.

For more information visit http://education.emc.com/academicalliance OR contact us at Academic_Alliance_Program_Office@emc.com.
Vendor Session — NetApp

Friday Oct 21, 11:30am—12:15pm
Room: Grant Ballroom

Transforming Information Technology Curricula with Innovative Storage & Data Management Teaching Resources

Mark Conway – Sr. Program Lead — NetApp Academic Alliances Program

There is a data explosion underway that is fundamentally changing how data is stored, managed and preserved. It is also changing the skills and technologies IT-savvy graduates need to understand, and the topics and technologies that leading Information Technology programs need to cover.

Driven by digitization, booming user storage demands, shared-service computing models like cloud and virtualization, and even the advent of “Big Data”, CIOs & IT Departments are routinely faced with managing multiple Petabytes of data much more efficiently. They are using a new generation of storage and data management technologies to manage an increasingly complex and strategic storage environment. While these technologies are being adopted widely by IT departments world-wide, many IT programs have been slow to update their courses to reflect the changing IT landscape and to prepare students for today’s storage-intensive computing environments. This is where NetApp’s Academic Alliances Program can help.

Please plan to join this session to learn about the new, NetApp Academic Alliances Program, and the innovative teaching resources we can provide to enrich your curricula and your students’ learning opportunities.
Lunch — NSF Talk

Friday Oct 21, 12:15pm—1:15pm
Room: Washington Ballroom

Lunch talk by Suzanne Westbrook from the National Science Foundation.

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Paper Session 11 — Databases and Cloud Computing

Friday Oct 21, 1:15pm — 2:30pm
Room: Bradley
Session Chair: Susan Miertschin, University of Houston

SAVI: A new system for Advanced SQL Visualization

Umberto Ferraro Petrillo, Univ. of Rome
Maurizio Cembalo, Univ. of Rome
Alfredo De Santis, Univ. of Rome

In this paper, we present SAVI, a new system for supporting the teaching and the understanding of the semantics of the SQL language. SAVI uses visualization to explain the way some of the SQL operators select and transform data from a target database. The contribution of our paper is two-fold. From a conceptual point of view, we improve the visualization approach provided by existing systems, in order to address the mental visualization problem faced by students when learning SQL. From a technological point of view, we leverage on emerging web technologies to develop a visualization infrastructure that can be seamlessly run on any standard HTML5-capable browser, without any need for an additional software or virtual machine installation.
Paper Session 11 — Databases and Cloud Computing (cont’d)

Friday Oct 21, 1:15pm — 2:30pm
Room: Bradley
Session Chair: Susan Miertschin, University of Houston

**Databases in the Cloud: a Status Report**

*Jai Kang, Rochester Institute of Technology*
*Edward Holden, Rochester Institute of Technology*
*Dianne Bills, Rochester Institute of Technology*
*Geoffrey Anderson, Rochester Institute of Technology*

This paper updates an earlier paper on the use of cloud computing in database curriculum. That paper described a curricular initiative in cloud computing initially intended to keep our information technology (IT) curriculum at the forefront of technology and to give students the flexibility to work at any location, not just our labs. Currently, our IT degrees offer extensive database concentrations at both the undergraduate (BS-IT) and graduate (MS-IT) levels. This paper reports on the results of two years of operation using a cloud provider for lab exercises in our Database Architecture and Implementation course. It discusses the benefits gained and concludes with an overview of a new cloud deployment strategy that improves disaster planning for our curricular infrastructure and provides an extension to another campus. We discuss how the Cloud Vendor Selection Model, proposed in our previous paper, shows the ways in which the different layers of cloud services interact with each other. Plus we show how the different categories of cloud users in this model can be supported by different educational tools to meet course objectives. Finally, we discuss the various issues and challenges that we have experienced when implementing cloud solutions in an educational environment.

**Introducing Cloud Computing with a Senior Design Project in Undergraduate Education of Computer System and Network Administration**

*Xinli Wang, Michigan Technological University*
*Guy Hembroff, Michigan Technological University*
*Alexander Cerier, Michigan Technological University*
*Brian Perrault, Michigan Technological University*

With the rapid growth of operational cloud computing systems and their user community, it is desirable to incorporate the management and administration of cloud computing into the curriculum of information technology (IT) education to meet the needs of the industry and its users. It is challenging to teach cloud computing in a regular IT course with hands-on activities due to various reasons including the lack of equipment and software to build a cloud. During the last two semesters, we had incorporated cloud computing into our curriculum of undergraduate education for computer systems and network administration through a senior design project. In this project, two clouds were built using commonly available equipment by integrating a number of open source software units. Through this project, the students learned the basic concepts and knowledge of cloud computing as well as related technologies. The students and faculty advisers gained valuable experience by deploying, configuring and integrating computing clouds, and this knowledge was conveyed to other students and faculty through monthly presentations and a final project presentation. In this paper, we will present these two clouds and discuss the experience gained from this project with the hope of being a reference for others in the IT education community.
Paper Session 12 — Approaches to Intro Programming

Friday Oct 21, 1:15pm — 2:30pm
Room: Grant Ballroom
Session Chair: Annu Prabhakar, University of Cincinnati

Implementing IT0/CS0 with Scratch, App Inventor for Android, and Lego Mindstorms
Suleyman Uludag, The University of Michigan - Flint
Murat Karakus, The University of Michigan - Flint
Stephen W. Turner, The University of Michigan - Flint

The trend of declining enrollment and interest in computing fields, combined with increased demand from the industry, challenges instructors to come up with new, fresh and appealing methodologies to attract and retain students. Further, with the diffusion of information and computing technologies into almost all fields of study, introductory computing courses for non-majors need approaches that motivate students to feel comfortable with the life-long learning of computing concepts and tools. The goal of this paper is to summarize our teaching experience blending the aforementioned two needs into one course that may be considered as a type of CS0/IT0 course. With the pedagogical underpinnings stemming from constructionist learning and contextualized computing education, we present our motivation and the details of a course that uses the Scratch programming language, App Inventor for Android, and Lego Mindstorm robotics.

A minimal, extensible, drag-and-drop implementation of the C programming language
Stefano Federici, Università Di Cagliari

Block languages are visual programming languages based on the metaphor of programming bricks. Block languages such as Scratch, are becoming fundamental tools to get children interested in computer programming. These environments and environments derived from them, such as BYOB, have all the features needed to be strong candidates for introductory computer science courses and are starting to be used in some introductory university courses. Nonetheless, some computer science educators at college and university level feel that block languages are too toylike to be used in regular computer science curricula. Standard programming languages, such as C or Java, are still thought of as more appropriate. In this work I will describe a third way to programming languages that can be used for introductory computer science: the visual implementations of relevant subsets of standard programming languages. An initial evaluation showing excellent student acceptance is reported in this paper.

Teaching Garbage Collection with Open Source Virtual Machine
Delvin C Defoe, Rose-Hulman Institute of Technology

Garbage collection is an integral and fundamental component of every modern memory-managed programming language platform such as Java and Microsoft .Net. Yet, few Computer Science and Information Technology programs offer students a course on garbage collection. High tech companies wish that their new employees knew something about garbage collection as this would help them with decisions concerning languages that are most appropriate for implementing software solutions on behalf of their clients. To address this limitation, we have created a junior level undergraduate garbage collection course that gives students practical experience in exploring, designing, and implementing garbage collection algorithms in the context of an open source virtual machine. We have taught this course twice and on both occasions students were pleased with their learning experience.
Multimedia-Based Visual Programming Promoting Core Competencies in IT Education

Michael Halper, New Jersey Institute of Technology
V. J. Manzo, Temple University
Matthew Halper, Kean University

Programming constitutes one of the core competencies demanded of any IT education. However, some students within certain specializations of this diverse discipline are inclined to question the need for programming. The use of a visual programming environment in the development of interactive multimedia applications can serve the dual purposes of getting students excited about programming and giving them the core knowledge they need. The visual language Max, geared toward music, audio, and video application programming, is introduced as an excellent vehicle toward achieving this goal. The foundational constructs of Max are introduced in a series of example programs dealing with music applications. Some details of an IT course called “Interactive Music System Technology” that utilizes Max are presented. Overall, the use of Max in the IT curriculum can enhance the student’s experience (both in multimedia and in IT in general) and promote better programming skills.

Visualizing the Modern Operating System: Simulation Experiments Supporting Enhanced Learning

Besim Mustafa, Edge Hill University

An important area of modern computer organization and architecture is the operating system the internals of which is normally inaccessible for teaching and learning purposes. This paper describes an educational operating system simulator that is part of an integrated set of simulators designed to support students of computer architecture and operating systems. Examples of classroom assignments are presented demonstrating the simulator’s support for a wide range of practical experiments. The pedagogical value of the simulator is assessed in terms of the educational impact of its visualization features and its functional capabilities for supporting students at different levels of learning. Finally, the preliminary results of the evaluation of the simulator that provide an indication of its value as a teaching and learning resource are presented.

An Architecture for Delivery of Distance Education in Developing Countries

Khondkar Islam, George Mason University
Charles Snow, George Mason University

In the face of the slow growth of education in developing nations, Distance Education (DE) can be leveraged to boost literacy rates there. Classroom instructional resource and teaching staff shortages are prime contributing factors to this slow growth. Research shows DE instruction is as effective as traditional classroom instruction: students learn as much, if not more, via DE as they do in classrooms. Numerous distance learning tools are on the market for delivering instruction to students in remote locations. The question is whether these tools can be efficiently used by individuals accessing instruction materials from a location in a developing country where there is limited network capacity. This paper discusses our research effort for the design and development of a cost-effective, distributed, peer-to-peer, overlay multicast architecture to support DE using distance learning tools over wired and terrestrial wireless networks of limited capacity.
Paper Session 14 — Unique Courses

Friday Oct 21, 2:45pm — 4:00pm
Room: Grant Ballroom
Session Chair: Patricia Wheeler, SUNY Empire State College

Teaching Enterprise Application Development: Strategies and Challenges

*David Whittinghill, Purdue University*
*Kyle Lutes Lutes, Purdue University*

Enterprise application development requires a skill set that is broader than that provided by traditional programming courses. Enterprise applications are distributed, networked, multi-user, and architecturally complex. Enterprise developers must possess knowledge of a programming language as well as ancillary concepts such as networking, application security, RDBMS's, concurrency, deployment and scaling. They should be knowledgeable with at least one specific platform, (e.g. J2EE or .NET). This collection of competencies is not often found in the software development curriculum as a whole but rather is touched upon across many different courses. This ad hoc approach cannot provide in-depth knowledge of the principles, patterns, and techniques used for enterprise application development. We present the goals and history of our course, Enterprise Application Development, the framework we have used, and the challenges that can arise in administering this coursework.

Teaching Natural User Interaction Using OpenNI and the Microsoft Kinect Sensor

*Norman Villaroman, Brigham Young University*
*Dale Rowe, Brigham Young University*
*Bret Swan, Brigham Young University*

The launch of the Microsoft Kinect for Xbox (a real-time 3D imaging device) and supporting libraries has spurred a flurry of development of, among other things, natural user interfaces for computer applications. Using Kinect offers opportunities for novel approaches to classroom instruction on natural user interaction. With the launch of this sensor came the establishment of development platforms that are able to collect and process the data that this sensor provides, one of which is OpenNI. We evaluate the current state of this technology, and present examples of how Kinect-enabled user interfaces can provide tremendous opportunities for students in Human Computer Interaction (HCI) courses. Our paper presents sample learning activities to achieve various HCI learning outcomes listed in IT 2008. The advantages of using this as a tool in the classroom are discussed.

Teaching Innovation-On-Demand in an Undergraduate Information Technology Program

*Ron Fulbright, University of South Carolina Upstate*

Innovative Problem Solving is a methodology for developing incremental improvements, or innovations, for any type of system. IPS represents a powerful critical and alternative thinking skill we wish to instill in every graduate of the Bachelor of Arts in Information Management & Systems program at the University of South Carolina Upstate. A new three credit hour course teaching IPS, called SIMS 307: Systematic Innovation, has been added as a required course at the sophomore level. Some of the course material was adapted from an existing professional training class historically taught to post-baccalaureate working professionals with an average age of 35. Adapting the course for students with an average age of 20, very little professional experience, and only one year of college education has required much effort. This paper describes IPS and some of the challenges overcome in designing and delivering the course.
Hudson River Tour and Dinner

Friday Oct 21, 4:30pm – 6:30pm
**Paper Session 15 — IT in the Health Domain**

**Saturday Oct 22, 8:30am — 9:45am**
**Room: Bradley**
**Session Chair: Chi Zhang, Southern Polytechnic State University**

**A Health IT Application Domain Course for a Traditional IT Program**  
*Joseph J. Ekstrom, Brigham Young University*  
*Chia-Chi Teng, Brigham Young University*

IT2008 specifically mentioned health care as an area of probable interest for “application domain classes”. This paper documents our initial foray into providing a domain specific course in Health Information Technology (HIT) for Seniors in an IT Program. Studies estimate tens of thousands of IT professional will be needed in the coming years in the United States alone. However, most of the “health informatics” courses currently in academic curriculum are offered in health science programs targeted for future health care professionals who are IT users. Little curriculum has been developed to train engineering and technology students who are already fluent in the core IT competencies for a profession in the health care domain. We have piloted a senior level course to introduce current HIT topics, standards, requirements and issues with hands-on lab activities and programming exercises where students learn some common technical skills required for an HIT professional.

**Information Technology for Continuous Patient Health Education**  
*Joseph Finkelstein, Johns Hopkins University*  
*Jeffrey Wood, Johns Hopkins University*

Information technology for continuous patient health education and counseling could be a powerful means for health promotion and disease prevention. We developed a universal platform for Individualized Continuous Patient Education (iCOPE). This platform is a comprehensive informatics framework for rapid adaptation and dissemination of Comparative Effectiveness Research (CER) products tailored to different categories of health consumers including difficult-to-reach patients. The iCOPE platform implements universal means for customized delivery of CER information in the format of interactive self-paced educational modules, quick “question & answer” guides, and interactive decision aids. The iCOPE supports continuous patient health education by providing easy access to the interactive CER updates via web, Wii and phone-based interactive voice response technology and tailoring education to the needs and preferences of particular patients.

**A Trust-Aware Tag-Based Privacy Control for eHealth 2.0**  
*Brent Sargent, University of Washington Tacoma*  
*Kyle Levy, University of Washington Tacoma*  
*Yan Bai, University of Washington Tacoma*

Healthcare social networking is an emerging web 2.0 application that promise to bring about a whole revolution in the way that health care is delivered. In healthcare social networks, health information requires extra protection as its disclosure can have serious repercussions in the content owner’s private and professional life. We have developed a prototype of healthcare social network system (called Husky eHealth 2.0) with a trust-aware tag-based privacy control scheme. The scheme protects private information from unauthorized access using both tagging and trust ratings information. A preliminary evaluation of the prototype system is also given. The results have shown that Husky eHealth 2.0 provides an effective privacy control to healthcare social network users.
A Multi-layer Tree Model for Enterprise Vulnerability Management

Bin Wu, Southern Polytechnic State University
Andy Ju An Wang, Southern Polytechnic State University

Conducting enterprise-wide vulnerability assessment (VA) on a regular basis plays an important role in assessing an enterprise’s information system security status. However, an enterprise network is always very complex, separated into different types of zones, and consisting hundreds of hosts in the networks. The complexity of IT system makes VA an extremely time-consuming task for security professionals. They are seeking for an automated tool that helps monitor and manage the overall vulnerability of an enterprise. This paper presents a novel methodology that provides a dashboard solution for managing enterprise level vulnerability. In our methodology, we develop a multi-layer tree based model to describe enterprise vulnerability topology. Then we apply a client/server structure to gather vulnerability information from enterprise resources automatically. Finally a set of well-defined metric formulas is applied to produce a normalized vulnerability score for the whole enterprise.

A Solace in Quantum

Michael Costa, Fanshawe College

Qubits, Atoms, Photons, Entanglements, Quantum Mechanics and Diamonds meet the Information Age. Current research indicates that diamonds may hold the key to a cryptanalyst’s nightmare, ‘The unbreakable cipher’. This paper introduces the basic theory and principles behind this innovative technology, reports on the research that has led to present day breakthroughs, investigates those that hold promise and looks at the possibilities for future research in this field. This report is presented as a primer to the ‘World of Quantum Cryptography’ and its impact on Network Security and Management. Consequently, it does not provide any mathematical proofs behind the theoretical models which relate to Quantum Mechanics. It does, however, make reference to and direct those who require this depth of knowledge to the sources if this information is desired or is the basis for further research.

Measuring the performance of VoIP over Wireless LAN

Hetal Jasani, Northern Kentucky University
Keshav Neupane, Northern Kentucky University
Victor Kulgachev, Northern Kentucky University
Elam Andrew, Northern Kentucky University
Sri Vasireddy, Northern Kentucky University

IEEE 802.11 wireless local area network (WLAN) has become popular and has been providing excellent solution for wireless networking. With the popularity of WLAN and Voice over the Internet (VoIP) protocol, it is very essential to measure the performance of the VoIP over WLAN. The main goal here is to compare the performance of the Voice over IP protocol in both LAN(802.3) and WLAN(802.11). This paper will examine how this communication protocol will perform in two different network setups and will analyze the results obtained using OPNET modeler. It also examines the optimization of 802.11e for Quality of Service (QoS) using the priorities to provide real-time service for voice of the inter protocol.
Paper Session 17 — Capstone Courses

Saturday Oct 22, 10:10am — 11:00am
Room: Bradley
Session Chair: Edward Sobiesk, United States Military Academy

Capstone Experience – Lessons from an Undergraduate Research Group in Speech at UNH Manchester
Michael Jonas, University of New Hampshire at Manchester

In this paper we discuss transforming the newly created Capstone course in Computer Information Systems (CIS) at the University of New Hampshire at Manchester (UNHM) to mentor students in developing problem solving skills by immersing them in a real world research environment. UNHM is a commuter college, representing a non-traditional educational setting with a majority of students holding day jobs thus having limited free time. We use Automatic Speech Recognition (ASR) as the field of research, a cutting edge, complex and challenging technology that has a very appealing hands on nature where students can see tangible results of their work. Students learn to decompose problems, find solutions, self organize and establish leadership roles based on their skill sets and interests. This gives a unique opportunity to observe and guide the learning process that students use to solve a challenging research problem from that of a traditional external project oriented Capstone course where only milestones and end goals are seen. By exposing students to research, the goal of this project is to pique their interest in science and furthering their education beyond the undergraduate experience.

Effects of Communication, Leadership, and Team Performance on Successful IT Capstone Projects: A Case Study
Chi Zhang, Southern Polytechnic State University
Ju An Wang, Southern Polytechnic State University

To provide students with the opportunity to synthesize the knowledge and skills acquired from their prior courses into one final project, IT capstone projects have become an essential part of the IT curriculum. This paper presents the successes and challenges from the student groups with post-project survey and student self-reflection. Effective communication, strong leadership, and match-up of individual strengths and team roles emerged as the major factors contributing to the team success. The challenges include the size of the project team, the limited time to complete a comprehensive IT project, and the amount of effort on documentation. The intent of this paper is to have an in-depth understanding of the IT capstone projects to discover better approaches to enhancing student learning experience and improving teaching effectiveness in such capstone project courses in the future.
**Paper Session 18 — Student Research**

**Saturday Oct 22, 10:10am — 11:00am**  
Room: Grant Ballroom  
Session Chair: Amber Settle, DePaul University

**Do students have the relevant ICT skills they need to do their research projects?**  
*Oduronke Temitope Eyitayo, University of Botswana*

The final year research project is the capstone of undergraduate studies. Finding out the skills students have at final year helps determine how ready they are for their research projects as well as how prepared they are for the job market. In order to ascertain the Information Communication and Technology (ICT) literacy levels of students, a study was carried out using year four (final year) students across several faculties and departments in the University of Botswana using computer self efficacy instrument and Task characteristics. Prior to administering the questionnaire, a pilot test was conducted and reliability and validity tests were done. The data was analysed using SPSS. Chi-square and Cross Tabulation statistics were carried out. The results of the study revealed that students were lacking in skills needed specifically for academic research. Amongst others, the study recommends that the university should provide students with an IT fluency centre for individuals to concentrate on developing their skills. Workshops and demonstrations are recommended in which students can be given individual attention. A broader focus will be to incorporate technology into the curriculum of all courses and to improve the curriculum for the General Education Courses to include the desired skills.

**Enhancing Network Security Education with Research and Development Content**  
*Mostafa Bassiouni, University of Central Florida*  
*Ratan Guha, University of Central Florida*

Network Security (CNT 4403) is an undergraduate course offered for the IT and Computer Science majors at the University of Central Florida. In the recent offering of this course, we enhanced its teaching by adding research-oriented content. In this paper, we discuss our enhancement effort and give two examples. Through our research and graduate teaching, we identified important security aspects of the anycast technology that are overlooked by traditional textbooks on network security. We added content on anycast to give the undergraduate students better experience with emerging security applications. Similarly, we added content on the experimental Robust ECN protocol to give students exposure to new trends in combating malicious user behavior.
Panel 5 - CSTA National Standards and their Impact on the Future of K-12 Computer Education

Saturday Oct 22, 11:00am — 11:30am
Room: Grant Ballroom

Han Reichgelt, Southern Polytechnic State University
Barbara Price, Georgia Southern University
Jim Leone, Rochester Institute of Technology
Richards Helps, Brigham Young University

This panel will feature four speakers with an in-depth knowledge of accreditation and continuous improvement. It will be used both to inform the audience of some of the changes that are likely to occur in IT accreditation criteria in the near future and to seek feedback on specific accreditation-related questions.
Closing Session

Saturday Oct 22, 11:30am — 12:00am  
Room: Grant Ballroom  

Bryan Goda and Edward Sobiesk, United States Military Academy  
Randy Connolly, Mount Royal University  
Mark Stockman, University of Cincinnati
Plan to be here!
2012 SIGITE Conference
Mount Royal University
October 11 - 13, 2012

The 13th Annual Conference on Information Technology Education will be hosted by Mount Royal University and held at the Hotel Arts in the city of Calgary, Alberta, Canada. The conference is sponsored by the ACM Special Interest Group on Information Technology Education (SIGITE). The conference provides a forum for sharing and developing ideas relating to Information Technology research, education, applications, IT-industry-academia relationships and our roles as professionals, educators, and advocates for the effective use of Information Technology.

Calgary is a vibrant modern city with a population over 1.2 million, making it the fourth largest city in Canada. Host of the 1988 Winter Olympics, Calgary has an exciting cultural scene, ample shopping, and world renowned restaurants. From peaks to plains, Calgary has been blessed with abundant natural beauty. Whether it be rugged mountain parks, rolling prairies, boreal forests, or desert badlands, there is no shortage of natural recreations in the near vicinity of Calgary.

Mount Royal celebrated its 100th anniversary as a post-secondary institute in 2011 and today is home to over 12,000 credit students. The conference itself will be held in the Hotel Arts, which is a 175-room, full-service boutique hotel in the exciting heart of Calgary. It is steps away from the city’s emerging arts and entertainment district and its vibrant business center. It offers a relaxing blend of modern luxury and sumptuous cuisine. Enjoy personal restoration through its well-appointed suites, spa-like amenities, and its stunning pool and poolside patio. On the premises are two award-winning restaurants, the Saint Germain, and one of the city’s most chic retro-lounges, the Raw Bar.

sigite2012.sigite.org