Consortium for Computing Sciences in Colleges In cooperation with

The Association for Computing Machinery Special Interest Group on Computer Science Education presents

CCSCNE-2014

The Nineteenth Annual Consortium for Computing Sciences in Colleges Northeastern Conference



April 25 - 26, 2014 Providence, RI

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CCSCNE 2014 Chairs' Welcome

Welcome to CCSCNE-14. Providence College is happy to host the CCSC regional meeting that annually is the largest of them all.

For the last seven years, we have met in New York and along the Connecticut River but now we are back in Southeastern New England. Coincidentally, the last times we were here, we met at Providence College in 2005 and College of the Holy Cross in 2006. We will repeat that plan in 2014 and 2015. A lot has happened in Computing Sciences in those seven years.

Our Friday Keynote speaker from RPI, Jim Hendler, will address one of the major events in our field in those years—the emergence of Big Data. Our second keynoter, Mehran Sahami of Stanford University, will continue our long-standing emphasis on how to make the CS curriculum match the changes in the field. I thank Ingrid Russell and Val Kolesnikov for obtaining these speakers.

Our four workshops have a wide range of topics from robotics to software engineering. I thank Bonnie MacKeller and Krista Hill for organizing these.

The break-out sessions are a mix of papers and tutorials. Under the direction of Jim Teresco, who took on the new task of over-seeing all the reviewing, Bonnie Mackeller, Krista Hill, Susan Imberman, Yana Kortsarts, Ian MacDonald, and Mark Bailey chose the best presentations for our conference. John P. Russo and Jim Teresco reviewed the faculty posters.

All papers were double-blind reviewed and the acceptance rate for papers was 44%. I thank the committee and all reviewers for their dedication to this work.

This year, we have three events for students. Del Hart, Adam Villa and Namita Sarawagi are implementing the annual programming contest. The members of the Undergraduate Posters committee, Jeremy Brown, Alice Fischer, Sandeep Mitra and Bob Dugan, will review the posters during the conference.

At our planning meeting in September, I asked Darren Lim and Karl Wurst to develop another activity for students between the programming contest on Friday morning and the student posters on Friday afternoon. They and Stony Jackson are producing "h@ckfest" involving HFOSS.

I thank Mark Hoffman and Lisa Michaud for handling all matters regarding conference registration, as well as, Nadine Hanebutte for producing the conference program. In addition, Mike Gousie has gathered the information that is printed in the CCSC Journal.

Finally, I must thank my secretary, Lynne DeMasi, who has a big book where she keeps all the details of the planning together.

So, again, welcome to CCSCNE-14. Please enjoy this wonderful event.

Frank Ford
Conference Chair
Providence College

CCSCNE 2014 Committee

Frank Ford

Conference Chair Faculty Posters Co-Chair Providence College

Adam Villa

Programming Contest Co-Chair Providence College

Mark Bailey

Papers Co-Chair Hamilton College

John Russo

Faculty Posters Co-Chair Wentworth Institute of Technology

Susan Imberman

Panels and Demos Co-Chair College of Staten Island

Jeremy Brown

Undergraduate Poster Co-Chair Rochester Institute of Technology

Alice Fisher

Undergraduate Poster Co-Chair University of New Haven

Krista Hill

Tutorials and Workshops Co-Chair *University of Hartford*

Mark Hoffman

Registration Co-Chair Quinnipiac University

Nadine Hanebutte

Publicity Chair St. John Fisher College

Val Kolesnikov

Speaker Chair Manhattan College **Delbert Hart**

Programming Contest Co-Chair SUNY Plattsburgh

Namita Sarawagi

Programming Contest Co-Chair Rhode Island College

Ian MacDonald

Papers Co-Chair
The College of Saint Rose

Jim Teresco

Reviewers Chair Faculty Posters Co-Chair The College of Saint Rose

Yana Kortsarts

Panels and Demos Co-Chair Widener University

Robert Dugan

Undergraduate Poster Co-Chair Stonehill College

Sandeep Mitra

Undergraduate Poster Co-Chair The College at Brockport

Bonnie MacKellar

Tutorials and Workshops Co-Chair St. John's University

Lisa Michaud

Registration Co-Chair Merrimack College

Darren Lim

Web Design Contest Chair Siena College

Ingrid Russell

Speaker Chair
University of Hartford

Conference Supporters









Program of Events: Friday, April 25

Registration (10:00 AM - 4:00 PM)

Registration & hospitalities

Slavin Center outside '64 Hall

Programming Contest (8:00 AM - 12:30 PM)

8:00 Registration of teams Accinno Hall Lobby

8:00 Hospitalities Accinno Hall Room 201

9:00 Initial meeting & presentation of problems Accinno Hall Lobby

9:15 Contest Accinno Hall Rooms 100, 202, 207

12:00 Programming contest lunch Accinno Hall Room 201

Workshop Registration & Breakfast (8:00 AM - 9:00 AM)

Workshops 1, 3, and 4 Slavin Center outside '64 Hall

Library Room 233

Pre-Conference Workshops (9:00 AM - 12:00 PM)

Workshop 1:

Workshop 2

Slavin Center Room LL 19

Using the NAO Humanoid Robot in the Classroom

David Eggert and Christopher Martinez, University of New Haven

Workshop 2:

Library Room 233

Getting Started in Open Source – A Tour of a Real Project
Heidi Ellis, Western New England University
Darci Burdge, Western New England University
Lori Postner, Nassau Community College
Gregory Hislop, Drexel University

Workshop 3:

Alumni Hall Alumni Private Dining Room

Mobile Computational Thinking with App Inventor 2

Franklyn Turbak, Wellesley College

Shaileen Pokress, Massachusetts Institute of Technology

Mark Sherman, University of Massachusetts Lowell

Workshop 4

Slavin Center Room 112

Teaching Life Lessons in a Capstone Course:
Software Engineering as a Finishing School

Darren Lim and Timoth Lederman, Siena College

H@ckfest for Students and Faculty (2:30 PM - 11:59 PM)

H@ckfest

Accinno Hall Rooms 100, 202, 207

Check-In & Hospitalities

Accinno Hall Room 201

Welcome (1:00 PM - 1:15 PM)

Welcome Address

Slavin Center '64 Hall

Plenary Session 1 (1:15 PM - 2:15 PM)

Big Data Meets Computer Science

Slavin Center '64 Hall

Jim Hendler, Director

Rensselaer Polytechnic Institute for Data Exploration and Applications

Break (2:15 PM – 2:30 PM) - Slavin Center outside '64 Hall

Concurrent Session 1 (2:30 PM - 3:45 PM)

Paper Session 1A: Algorithmic/Computational Thinking (Session chair: Dr. Joan E. DeBello)

Slavin Center Room LL 01

A Flipped CSO Classroom: Applying Bloom's Taxonomy to Algorithmic Thinking

Namita Sarawagi, Rhode Island College

Problem Solving and Algorithmic Thinking

Ed Lamagna, University of Rhode Island

Computational Thinking Expanding the Toolkit

Susan Imberman, College of Staten Island Deborah Sturm, College of Staten Island Mohammed Azhar, Borough of Manhattan Community College

Tutorial Session 1B

Slavin Center Room 112

Creating a GPS/GIS Technologies Course Module Using Google Earth

Rajesh Prasad, Saint Anselm College Carol Traynor, Saint Anselm College

Paper Session 1C: Alternative Approaches

Slavin Center Room LL 03

(Session chair: Dr. Alice Fisher)

The Affective Tutor

Timothy Hickey, Brandeis University William Tarimo, Brandeis University

A Game Programming Instructional Design Model

Penn Wu, DeVry University

The Human Computer

Christopher Stuetzle, Merrimack College

Break (3:45 PM – 4:15 PM) - Slavin Center outside '64 Hall

Concurrent Session 2 (4:15 PM - 5:30 PM)

Paper Session 2A: Special Topics Slavin Center Room LL 01

(Session chair: Dr. Daniel Rogers)

A Cryptographic Sandbox for an Introductory Security Course in Information Technology

Michael Jonas, University of New Hampshire at Manchester

An Introduction to Event–Based Programming in App Inventor

Franklyn Turbak, Wellesley College Mark Sherman, University of Massachusetts Fred Martin, University of Massachusetts Lowell David Wolber, University of San Francisco Shaileen Pokress, Massachusetts Institute of Technology

Tutorial Session 2B:

Slavin Center Room 112

NetLogo and Multi-Agent Simulation (In Introductory Computer Science)

Matthew Dickerson, Middlebury College

Tutorial Session 2C

Slavin Center Room LL 03

3D Printing-Why All the Fuss? Assembly Process and Demonstration

Greg Pleva, Southern Oregon University

Social Hour (5:30 PM - 7:00 PM)

Faculty Posters & Reception Slavin Center at and outside McPhail's

Student Posters Slavin Center at and outside McPhail's

Dinner Banquet (7:00 PM - 9:00 PM)

Presentation of Awards for Programming Contest, H@ckfest and Student Posters

Slavin Center '64 Hall

Program of Events: Saturday, April 26

Registration (7:30 AM - 10:00 AM)

Registration & hospitalities

Slavin Center outside '64 Hall

Plenary Session 2 (9:00 AM - 10:00 AM)

Computer Science Curricula for the Coming Decade

Slavin Center '64 Hall

Mehran Sahami, Stanford University

Concurrent Session 3 (10:00 AM - 11:15 AM)

Papers Session 3A: *Upper-Level Courses*

Slavin Center Room LL 01

(Session chair: Dr. Adrian Ionescu)

A Project-based Curriculum for Algorithm Design and Intractability Centered on the Traveling Salesperson Problem

Andrea Lobo, Rowan University Ganesh Baliga, Rowan University

Discovering the Java Reflection API with an Iterated Prisoner's Dilemma

Drue Coles, Bloomsberg University

Evil Robots and Helpful Droids: A Seminar for a Junior/Senior Artificial Intelligence Course

Lisa Michaud, Merrimack College

Tutorial 3B

Slavin Center Room 112

Board Game Strategies as an Intro CS Project

James Heliotis, Rochester Institute of Technology Ivona Bezakova, Rochester Institute of Technology Sean Strout, Rochester Institute of Technology

Panel 3C

Slavin Center Room 112

NSF-Sponsored Innovative Approaches to Undergraduate Computer Science

Matthew Dickerson, Middlebury College Stephen Bloch, Adelphi University Peter DePasquale, The College of New Jersey Amruth Kumar, Ramapo College of New Jersey Stan Kurkovsky, Central Connecticut State University Clif Kussmaul, Muhlenberg College

Break (11:15 AM - 11:30 AM) - Slavin Center outside '64 Hall

Concurrent Session 4 (11:30 AM - 1:15 PM)

Paper and Demo Session 4A: Teaching Tools

Slavin Center Room LL 01

S

(Session chair: Dr. Yana Kortsarts)

Come Code with Codester: An Educational App That Teaches Computer Science to K-12 Students

Darren Lim, Siena College Gili Rusak, Siena College

A New Browser-based C Programming Environment for CS1

Derrell Lipman, University of Massachusetts Lowell

Demo: Using Auto-Generated Materials to Facilitate Instructors'
Offline Preparation Time and Improve Students' Learning Outcomes

Duo (Helen) Wei, Richard Stockton College of New Jersey Sen Zhang, SUNY Oneonta

Tutorial Session 4B

Slavin Center Room 112

Python as a First Programming Language

Charles Dierbach, Towson University

Tutorial Session 4C

Slavin Center Room LL 03

Let's Start Flipping (the Classroom)

Namita Sarawagi, Rhode Island College

Membership Meeting (1:30 PM - 2:00 PM)

Membership Meeting

Slavin Center Room LL 19

Board Meeting (2:00 PM - 4:00 PM)

Board Meeting

Slavin Center Room LL 19

Faculty Posters

1: Integrating Computer Science Components into Undergraduate Level Medical Informatics Curriculum

Duo (Helen) Wei, Richard Stockton College of New Jersey

2: Pedagogical Aspects Of Mentoring in an Outreach Program

Bruria Haberman, The Weizmann Institute of Science Orni Meerbaum-Salant, The Weizmann Institute of Science Cecile Yehezkel, Bar Ilan University

3: Adoption of Schematic Based Approach to Soft-Processors in Devices Lab Course

Krista M. Hill, University of Hartford

4: Interdisciplinary Group Projects in Game Design and Mobile Web and App Development

Beryl Hoffman, Elms College

Student Posters

5001: Women in Computing: What Works

Kaitlyn Hitchcock and Alexandra Wentzel, Widener University

5003: Interactive Visualization of the Mandelbrot Set Using Parallel Computation

Shawn Ward, SUNY Geneseo

5004: A Mobile Application to Track Campus Shuttle Buses

Jeffrey Fisher, Evan Fleisher and Matthew Andre, The College at Brockport

5006: The Feeling of Sound

Matthew Ciarletto and Christian Ruiz, University of New Haven

5007: Project IRIS - Wi-Fi Communication between Workout-Tracking Watch and Web Application

Matthew Ciarletto and Timothy Whitfield, University of New Haven

5008: Linguistics-based Psychological Profiling in Digital Forensics

Kyle Anthony and Timothy Whitfield, University of New Haven

5009: Persistent Medical Monitoring Using Raspberry Pi Devices

Kun Jiang and Daniel Wiederecht, Widener University

5011: An Evolutionary Algorithm for Stone Facades

Kraig Boates, Stonehill College

5012: Adaptive Systems: Making Reading Easier

Sarah Hammond, Hamilton College

5013: Comparing the Performance of Distributed Machine Learning

Algorithms

Herb Sussman, SUNY Geneseo

5014: A Parallel Solution to Image Collection and Analysis

Tyler Barber and Matthew Hunger, SUNY Potsdam

5015: Cryptographic Libraries

Max Reinhold, SUNY Oneonta

5016: Semi-Automatic Discovery and Categorization of Semantic ErrorsAdam Gwilliam, Hamilton College

5017: Using a Beowulf Cluster for the Computation of Allelic Frequencies on DNA Samples

Justin Jiang, Patrick Ryan, Grant Fitzgerald, Richard Hayes, Julian Kuk, Chester Moses and Lindsay Schulman, Mass Bay Community College

5018: English Chinese Learning System

Stephen Chin, Tuo Chen and Samip Suwal, Salem State University

5019: Graphical Visualization of Eye-Tracking Data

Tongbo Sui, Wheaton College

5020: Visualization of Diverse Cellular Automata on a Computer Cluster

Lucas Groenendaal, SUNY Geneseo

5021: Lexos: A Text Mining Workflow

Devin Delfino, Bryan Jensen, Mengyang Li, Julia Morneau and Richard Neal, Wheaton College

5022: Implementing a Graphical User Interface for SNOMED CT

Anthony Masi, Manhattan College

5023: Development of Problem Corpus for Introductory Computer Science

Margaret Coleman and Katherine Droppa, Hamilton College

5024: Dominating Sets in Wireless Sensor Networks

Michelle Tanco, Ursinus College

5025: iOS Athletics App

Kyle Anthony, Roberto Mejia, Ben Bates and ReeceAnn Buendia, University of New Haven

5026: Parallel Processing in Ant Colony Optimization

Edward Pryor, SUNY Potsdam

5027: Messy Desk: A Collaborative Tool For Students

Shelby Malone, Canisius College

5028: Icon Skunk

Sam Alexander, Quinnipiac University

5030: Software Patents and the Controversy Behind It

Todd Bayne, Quinnipiac University

5031: Individual Differences in Sender Believability's Impact on Deception Detection Judgment Measured with fNIRS

Nicholas Brewer, Elliott Greenham and Samuel Kotlove, Hamilton College

5032: Factoring Integers with MPI and CUDA: Parallel Programming on Clusters and GPUs

Andrew Barkley and Marc Dean Jr., SUNY Potsdam

5033: 2D Game Development Using XNA

Tom Marini, Salem State University

5034: An Arduino-Based Queue Monitoring and Analysis System for School Cafeterias

Ryan Randall, Stonehill College

5035: CodeSync: A Collaborative Coding Environment for Novice Web Developers

Monica Starr Feldman, Wellesley College

5036: Unriddle the Cube: A Leap Motion App

Clayton Rieck, Bryan Jensen, Aimee Avila and Robert Gutierrez, Wheaton College

5037: Massive Parallel Acoustic Training in Speech Using the SETI Model

Colby Johnson, Tom McCarthy, David Meehan and Forrest Suprenant, University of New Hampshire at Manchester

5038: Genetic Algorithm Population Simulation

Christopher Zumberge, Muhlenberg College

5039: Culinary Scheduling Assistant Application

Timothy Gee, Muhlenberg College

5040: Architecture Re-Design and Simulation

Nicholas Dibartolomeo, Benjamin Foster and Zachary Harvey, SUNYIT Utica

5041: Extending Quizly

Bhargavi Ramanathan, Wellesley College

5042: Improving App Inventor Debugging Support

Johanna Okerlund, Wellesley College

5044: Integrating App Inventor Applications With SQL Database Services

David Meehan, University of New Hampshire at Manchester

5046: The Language of Facebook Users: A Qualitative and Quantitative

Model for Identifying Personality Traits

Rachel Friedman and Chris Lepre, Hamilton College

5047: Engaging Pre-college Students in CyberSecurity Using Animations and Games

John Remondi, Mass Bay Community College

5048: Fairness in Employee Scheduling

Erica Stockwell-Alpert, Connecticut College

5050: Adding New List Operators to App Inventor

Soojin Kim, Wellesley College

5051: Improving the Usability of App Inventor through Conversion between Blocks and Text

Karishma Chadha, Wellesley College

5053: GRAPH-ENE - A Web Based Graphing Program

James Torres, Rhode Island College

5055: LyonTracks

Evan Chessman, Alicia Herbert, Julia Morneau and Richard Neal, Wheaton College

5056: Sentiment Analysis of Egyptian Arabic in Social Media

Mohamed Abdalkader, Haverford College

5057: Testing 3D Capabilities of Virtual Reality Hardware

Justin Anderson, Connecticut College

5058: Path Planning for Sidewalk Snow Clearing using AI search

Riley Bauer, The College at Brockport

5059: Dusty Vent: Rapid Game Prototyping using HTML5/Javascript and C++/Simple DirectMedia Layer

Jeffrey Swift, Nicholas Freville and Patrick Hodge, SUNY Fredonia

About the Keynote Speakers

Jim Hendler

Director, Rensselaer Institute for Data Exploration and Applications, Rensselaer Polytechnic Institute

Jim Hendler is the Director of the Institute for Data Exploration and Applications and the Tetherless World Professor of Computer, Web and Cognitive Sciences at RPI. An early researcher in the "Semantic Web area," he was the recipient of a 1995 Fulbright Foundation Fellowship, is a former member of the US Air Force Science Advisory Board, and is a Fellow of the American Association for Artificial Intelligence, the British Computer Society, the IEEE and the AAAS and was the first computer scientist to serve on the Board of Reviewing editors for Science. He is also the former Chief Scientist of the Information Systems Office at the US Defense Advanced Research Projects Agency (DARPA) and was awarded a US Air Force Exceptional Civilian Service Medal in 2002. In 2010, he was named one of the 20 most innovative professors in America by Playboy magazine and was selected as an "Internet Web Expert" by the US government. In 2012, he was one of the inaugural recipients of the Strata Conference "Big Data" awards for his work on large-scale open government data, and he is a columnist and associate editor of the Big Data journal. In 2013, Governor Andrew Cuomo appointed Jim Hendler to be New York State's Open Data Advisor.

Mehran Sahami

Professor and Associate Chair for Education in the Computer Science Department, and the Robert and Ruth Halperin University Fellow in Undergraduate Education, Stanford University

Mehran Sahami is a Professor and Associate Chair for Education in the Computer Science department, and the Robert and Ruth Halperin University Fellow in Undergraduate Education at Stanford University. Prior to joining the Stanford faculty, he was a Senior Research Scientist at Google for several years. His research interests include computer science education, machine learning, and web search. He is co-chair of the ACM/IEEE-CS joint task force on Computer Science Curricula 2013 (CS2013). He has published over 40 technical papers and has over 20 patent filings. He received his BS, MS, and Ph.D. in Computer Science from Stanford University.

Colleges Participating in the 2014 Programming Contest

Central Connecticut State University

Chestnut Hill College

Clark University

Fitchburg State University

Framingham State University

Hamilton College

Manhattan College

Middlebury College

Muhlenberg College

Pennsylvania College of Technology

Providence College

Rhode Island College

Salem State University

Southern Maine Community College

St. John's University

SUNY Fredonia

SUNY Oneonta

SUNY Orange

SUNY Plattsburgh

The College at Brockport

The College of Saint Rose

The University of New Haven

University of New Hampshire at Manchester

University of Maine Farmington

Wellesley College

Wheaton College

Widener University

Reviewers

This conference is possible only because of the hard work of the entire community. CCSCNE gratefully acknowledges the following reviewers who assisted in selecting the workshops, tutorials, and papers presented at this conference.

John Avitabile,

College of Saint Rose, Albany, NY

Valerie Barr,

Union College, Schenectady, NY

Shari Bemis,

Keene State College, Keene, NH

Jonathan Blake

Quinnipiac University, Hamden, CT

Barbara Bracken,

Wilkes University, Wilkes-Barre, PA

Alistair Campbell,

Hamilton College, Clinton, NY

Aaron Cass,

Union College, Schenectady, NY

Yan Chen,

Borough of Manhattan Community College, New York, NY

Jean Coppola,

Pace University, New York, NY

Mary Courtney,

Pace University, New York, NY

Lawrence D'Antonio

Ramapo College, Mahwah, NJ

Anurag Dasgupt,

Edinboro University of Pennsylvania, Edinboro, PA

Adrienne Decker,

Rochester Institute of Technology, Rochester, NY

Peter Drexel,

Plymouth State University, Plymouth, NH

Christian Duncan,

Quinnipiac University, Hamden, CT

Emanuel Emanouilidis,

Kean University, Union, NJ

Joseph Fischbach,

Widener University, Chester, PA

Alice Fischer,

University of New Haven, West Haven, CT

Seth Freeman,

Capital Community College, Hartford, CT

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University of South Florida in Lakeland, Lakeland, FL

William Harrison,

St. John Fisher College, Rochester, NY

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SUNY Plattsburgh, Plattsburgh, NY

James Heliotis,

Rochester Institute of Technology, Rochester, NY

David Hemmendinger,

Union College, Schenectady, NY

Beryl Hoffman,

Elms College, Chicopee, MA

Susan Imberman,

College of Staten Island, New York, NY

Lubomir Ivanov,

Iona College, New Rochelle, NY

Michael Jonas,

University of New Hampshire, Manchester, NH

Seikyung Jung,

Bridgewater State University, Bridgewater, MA

Stella Kakavouli,

Wellesley College, Wellesley, MA

Chadi Kari,

Bridgewater State Unversity, Bridgewater, MA

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Merrimack College, North Andover, MA

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Central Connecticut State University, New Britain, CT

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Khalid Lateef,

Hood College, Frederick, MD

Joan Lucas,

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University of Massachusetts Lowell, Lowell, MA

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Lisa Michaud,

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Patricia Morreale,

Kean University, Union, NJ

Judith O'Rourke,

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Annandale-on-Hudson, NY

John Vaughn,

Hobart and William Smith College,

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Giovanni Vincenti,

University of Baltimore, Baltimore, MD Marc Waldman,

Manhattan College, New York, NY

Nick Webb,

Union College, Schenectady, NY

Richard Wyatt,

West Chester University, West Chester, PA

Beifang Yi,

Salem State University, Salem, MA

Jinghua Zhang,

Winston-Salem State University,

Winston-Salem, NC

See you next year for CCSCNE 2015

April 17-18, 2015 College of the Holy Cross Worcester, MA