

**Consortium for
Computing Sciences in Colleges**
In cooperation with

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



April 29 - 30, 2016
Clinton, NY

CCSCNE-2016

The Twenty-First Annual Consortium
for Computing Sciences in Colleges
Northeastern Conference

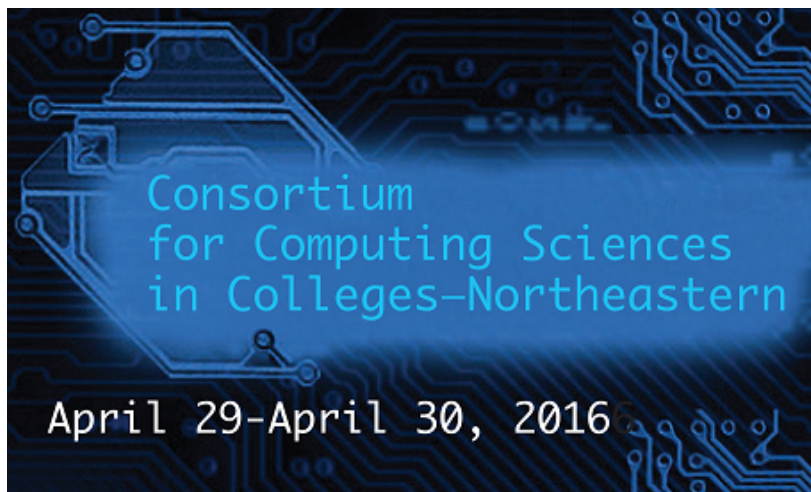


Table of Contents

1. Chair's Welcome	4
2. CCSCNE 2016 Committee	5
3. Conference Supporters	6
4. Wireless Access Information	7
5. Program of Events	
a. Friday	9
b. Saturday	13
6. Faculty Posters	16
7. The Keynote Speakers	18
8. Programming Contest Teams	20
9. Reviewers	21

CCSCNE 2016 Chair's Welcome

Welcome to Clinton, Hamilton College, and the Twenty First Annual Consortium for Computing Sciences in Colleges Northeast Region Conference.

This year's program is the result of hard work on the parts of the conference committee and the board. We are honored to have two invited speakers, Fred Schneider of Cornell University, and Shriram Krishnamurthi of Brown University. In addition, we have a broad range of topics covered by paper presentations, lightning talks, workshops, panels, tutorials, and faculty and student research posters. On Friday morning, we are hosting the traditional programming contest. On Friday afternoon, we have something new for students: a career fair. Hamilton students have been busy lining up companies to attend the fair in Sage Rink. We have worked hard to bring you an exciting program!

I have been fortunate to have worked with a terrific committee and dedicated board. The success of this conference is the result of the hard work of reviewers, session chairs, and countless volunteers. The conference continues to be selective; we accepted 10 of 19 papers for an acceptance rate of 52%. This ensures the high-quality program that everyone expects.

I am pleased to be hosting this year's conference at Hamilton College. Hamilton's 1,350-acre campus is situated on a hilltop overlooking the picturesque village of Clinton and is located in the foothills of the great Adirondack Park. An exclusively undergraduate institution with approximately 1,850 students, Hamilton is the third oldest college in New York State having just celebrated the college's bicentennial in 2012.

I hope you find the conference informative and engaging. I also look forward to seeing you next year at the College of Saint Rose in Albany, NY.

Mark W. Bailey
Conference Chair
Hamilton College

CCSCNE 2016 Committee

Conference Chair, **Mark Bailey**, *Hamilton College*
Programming Contest co-Chair, **Del Hart**, *SUNY Plattsburgh*
Programming Contest co-Chair, **Tony Sena**, *MassBay Community College*
Programming Contest co-Chair, **Susanne Steiger-Escobar**, *MassBay Community College*
Program Chair, **Jim Teresco**, *The College of Saint Rose*
Papers co-Chair, **Aaron Cass**, *Union College*
Papers co-Chair, **Darren Lim**, *Siena College*
Panels and Lightning Talks co-Chair, **Susan Imberman**, *College of Staten Island*
Panels and Lightning Talks co-Chair, **Yana Kortsarts**, *Widener University*
Student Posters co-Chair, **Alice Fischer**, *University of New Haven*
Student Posters co-Chair, **Aparna Mahadev**, *Worcester State University*
Student Posters co-Chair, **Sandeep Mitra**, *The College at Brockport*
Student Posters co-Chair, **Shamsi Moussavi**, *MassBay Community College*
Tutorials and Workshops Chair, **Bonnie MacKellar**, *St. John's University*
Registration co-Chair, **Stefan Christov**, *Quinnipiac University*
Registration co-Chair, **Mark Hoffman**, *Quinnipiac University*
Publicity Chair, **Ed Harcourt**, *St. Lawrence University*
Faculty Posters Chair, **Dan Rogers**, *The College at Brockport*
Speakers Chair, **Larry D'Antonio**, *Ramapo College*
Speakers Chair, **Ingrid Russell**, *University of Hartford*
Vendors Chair, **Karl Wurst**, *Worcester State University*
Encore co-Chair, **Lawrence D'Antonio**, *Ramapo College*
Encore co-Chair, **Michael Gousie**, *Wheaton College*
Encore co-Chair, **Jim Teresco**, *The College of Saint Rose*
Career Fair co-Chair, **Mykhailo Antoniv**, *Hamilton College*
Career Fair co-Chair, **Kelsey Babcock**, *Hamilton College*
Career Fair co-Chair, **Maggie Coleman**, *Hamilton College*
Career Fair co-Chair, **Alex Dennis**, *Hamilton College*
Career Fair co-Chair, **Emily Sears**, *Hamilton College*

Conference Supporters

CCSC National Partners

Platinum Level



Gold Level



Silver Level



Regional Partners



Wireless Network Access at Hamilton College

Connecting With Mac OS X:

1. Click on the airport icon at the top of the screen near the clock and click on **Hamilton Guest** Wi-Fi in the drop-down list.
2. Open a web browser (Firefox, Safari, etc.) and it will open the guest wireless access webpage. NOTE: You'll likely get a certificate error message and will need to accept the certificate or continue to the webpage.
3. Enter the guest username **ccscnquest** and password **Hamilton.2016** provided and click Agree and login. You'll now have internet access.

Connecting With Windows 7/ 8/ 8.1/ 10:

1. Right-click on the wireless icon at the bottom of the screen and click on View available wireless networks. (Or, do whatever you normally do to find a wireless network).
2. Select **Hamilton Guest** Wi-Fi and click Connect.
3. Open a web browser (Firefox, Internet Explorer, etc.) and it will open the guest wireless access webpage. NOTE: You'll likely get a certificate error message and will need to accept the certificate or continue to the webpage.
4. Enter the guest username **ccscnquest** and password **Hamilton.2016** provided and click Agree and login. You'll now have internet access.

Attendee Survey

Help us improve the conference. Please complete the conference evaluation.

<https://esurv.org?u=CCSCNE-2016>



Follow us on Twitter @CCSCNE

If you are tweeting about the conference, please use hashtag **#CCSCNE2016** so we can participate in each others' conversations.

Mobile-Friendly Program

CCSCNE 2016 has a mobile-friendly version of the conference program available.

Visit <http://program.ccsne.org/2016> with your mobile device's browser.

It will be cached by your browser, and available even when you don't have an Internet connection. It should be suitable for use on most browsers and devices. You can search the program for items, or filter the program items by date, time, category, and presenter. You can also "star" items (by clicking on the square next to an item) and then view just those items in the "My Conference" tab. Please see the "Info" tab for general conference information, maps, supporters and more instructions on using the program on your device.

The program is an instance of KonOpas (konopas.org), an open-source project providing conventions with easy-to-use mobile-friendly guides.



Program of Events: Friday, April 29

Registration (7:45 AM – 4:00 PM)

Registration

Taylor Science Atrium

Programming Contest (7:45-12:30)

7:45 Continental Breakfast Fillius Events Barn

8:40 Pre-contest instructions Fillius Events Barn

9:00 Contest Tolles Pavilion

12:00 Buffet Lunch Fillius Events Barn

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

Workshop 1

SCCT 3024

Reviewing NSF Proposals: Effective Proposal Writing via the Review Process

Paul Tymann, The National Science Foundation

Mike Erlinger, The National Science Foundation

Workshop 2

SCCT 3021

Computational Thinking in Greenfoot: AI Game Strategies for CS1

Michael Jonas, University of New Hampshire

Mihaela Sabin, University of New Hampshire

Workshop 3

SCCT 3040

Micro Labs: A Low-Cost Raspberry Pi Networking & Security Environment

Shamsi Moussavi, MassBay Community College

Giuseppe Sena, MassBay Community College

Andrew Liberatore, MassBay Community College

Christopher Bergerson, MassBay Community College

Welcome (1:00-1:15)

Welcome Address

Chapel

Patrick Reynolds, Vice President and Dean of the Faculty

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

Doctrines and Laws for Cybersecurity

Chapel

Fred B. Schneider, Cornell University

Break (2:15-2:30)

Taylor Science Atrium

ICCP Exam (2:30 – 5:30) Room: G042

ICCP (Institute for Certifications of Computer Professionals) Exam

<http://ccscne.org/news/iccp-at-ccscne-2016/>

Career Fair (2:30-5:00)

Sage Rink

Meet with representatives from : Agency Oasis, Black River Systems Inc, Critical Technologies, Eze Software Group, GrammaTech, RWC, SRC Inc., AmeriCU Credit Union, Booz Allen Hamilton, Harris Corporation, Turning Stone Casino, AX Enterprize, 2016 Fibonacci STEAM Conference, IBM, Syracuse University College of Engineering and Computer Science, and Utica National Insurance

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

Session 1A (Papers) Non-traditional Hardware

SCCT 2048

Session chair: John Avitabile, The College of Saint Rose

Hands-on Computer Security with a Raspberry Pi

Adam Villa, Providence College

An Android Application Development Class

Kevin McCullen, Plattsburgh State University

Session 1B (Tutorial): *Git Part 1*

SCCT G041

Git 101: Foundations for a Common Workflow to Contribute to HFOSS

Stoney Jackson, Western New England University

Darci Burdge, Nassau Community College

Session 1C (Panel): CS1

SCCT 3024

CS1: Why the First Programming Language Doesn't Matter

Session chair: Michael Gousie, Wheaton College (MA)

Christopher Stuetzle, Merrimack College

Rick Kline, Pace University

Frank Ford, Providence College

Refreshment Break (3:45-4:15)

Taylor Science Atrium

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

Session 2A (Papers): *Upper Level Courses*

SCCT 2048

Session chair: Dr. Joan E. DeBello, St. John's University

Export To Arduino: Teaching Processor Design With Arduinos

Michael Black, Bridgewater State University

Fast And Easy Parallel Processing On GPUs Using C Amp

Erik Wynters, Bloomsburg University of Pennsylvania

PLCC: A Programming Language Compiler Compiler,

Timothy Fossum, SUNY College at Potsdam (encore presentation of SIGCSE

2014 paper: <http://dl.acm.org/citation.cfm?id=2538922>)

Session 2B (Tutorial): *Git Part 2*

SCCT G041

Git 102: A Common Workflow to Contribute to HFOSS

Stoney Jackson, Western New England University

Darci Burdge, Nassau Community College

Session 2C (Panel)

SCCT 3024

Session chair: Yana Kortsarts, Widener University

Preparing Students For The Workplace Through An Apprenticeship Program

Stefan Christov, Quinnipiac University

Derek Koch, A100 Program

Brian Gill, Quinnipiac University

George Karagkiaouris, Quinnipiac University

Social Hour and Poster Sessions (5:30-7:00)

Reception

Taylor Science Atrium

Faculty Posters

Ground Floor

Taylor Science Center

Please see the complete list of posters later in the program.

Student Posters

Ground Floor

Taylor Science Center

Please see the complete list of posters and abstracts in the *Student Poster Abstracts* booklet.

Dinner/Banquet (7:00-9:00) Tolles Pavillion

Presentation of Awards

Tolles Pavilion

Program of Events: Saturday, April 30

Registration (7:30-10:00)

Registration

Taylor Science Atrium

Light Continental Breakfast (8:00-9:00)

Taylor Science Atrium

Concurrent Session 3 (9:00-10:15)
--

Session 3A (Papers/Lightning Talk): Location

SCCT 2048

Session chair: Michael Gousie, Wheaton College

The Value of a One Semester Exposure to the Institutional Review Board Process
Tanya Estes, United States Military Academy

Industry and Faculty Surveys Call for Increased Collaboration to Prepare Computing Graduates
Mihaela Sabin, University of New Hampshire

Designing a CIS Capstone Course: The Confluence of Business Planning and Application Development (lightning talk)
Hollis Davis, Wentworth Institute of Technology

Session 3B (Encore Tutorial)

SCCT 3021

On Beyond Sudoku: Pencil Puzzles for Introductory Computer Science
Zack Butler and Ivona Bezakova, Rochester Institute of Technology
SIGCSE 2015 Workshop abstract at
<http://dl.acm.org/citation.cfm?id=2678299>

Session 3C (Papers)**SCCT 3024**

Session chair: Ed Harcourt, St. Lawrence University

Computing With a Community Focus: Outcomes From an ApplInventor Summer Camp For Middle School Students

Lijun Ni, University of Massachusetts Lowell

Buy One Get One Free: Automata Theory Concepts Through Software Test

Alisa Neeman, University of Rio Grande

Plenary Session 2 (10:15-11:15)
--

Kennedy Auditorium (Taylor Science G027)

PS-PD-PR: Problem Solving, Program Design, and Peer Review

Shriram Krishnamurthi, Brown University

Break (11:15-11:30) Kennedy Auditorium Lobby

Concurrent Session 4 (11:30-12:45)

Session 4A (Papers): CS 1**SCCT 2048**

Session chair: Adrian Ionescu, Wagner College

Quantifying Introductory CS Students Iterative Software Process By Mining Version Control System Repositories

Lewis Baumstark, University of West Georgia

Early Detection of At-Risk Students in CS1 Using Teachback/Spinoza

William Tarimo, Brandeis University

Session 4B (Tutorial): FunWithSound**SCCT 3021**

Making Music with FunWithSound, Processing, and Java

David Hovemeyer, York College of Pennsylvania

Rethinking CCSCNE: Challenges and Opportunities

Session chair: Jim Teresco, The College of Saint Rose

Panel organized by CCSCNE board and conference committee members to get feedback about what people want to see in future CCSCNE conferences.

Larry D'Antonio, Ramapo College

Mark Hoffman, Quinnipiac Univeristy

Ingrid Russell, University of Hartford

Membership Meeting (1:15-1:45)	SCCT 3024
---------------------------------------	------------------

Board Meeting (1:45-3:45)	SCCT 3021
----------------------------------	------------------

Faculty Posters

1. **Thrust Makes It Easy To Introduce Parallel Processing On Gpus Into A Research Project Or College Course**
Erik L. Wynters, Bloomsburg University of Pennsylvania
2. **Using Java Lejos To Teach Robotics To Java Programmers**
Susan Ceklosky, Chestnut Hill College
3. **History, Trends & Ethical Issues: The Liberal Arts And Computer Science**
Lisa M. Olivieri, SSJ, Chestnut Hill College
4. **Introductory Course In Data Mining**
Yana Kortsarts, Widener University
5. **A WOMBAT ISA Simulation for Teaching Computer Architecture**
Dan Bennett, Edinboro University
6. **Capstone: Impact Of A Successful Undergraduate Research Program**
Michael Jonas, University of New Hampshire at Manchester
7. **Discovering Community Development Information From Social Media: A Social Media Analytics Project Using Ibm Bluemix**
Mohammed Ghriga, Long Island University, Brooklyn
Richard Shang, Long Island University, Brooklyn
Rshana Shurriah, Long Island University, Brooklyn
8. **Measuring Trajectories Of Informal Learning With App Inventor**
Benjamin Xie, Massachusetts Institute of Technology
Hal Abelson, Massachusetts Institute of Technology
9. **Emphasizing Space Efficiency In A Computer Science Curriculum**
Boris Brimkov, Rice University
10. **Reconfigurable Software Defined Radio Development Platform**
Marcel Filimon, University of New Hampshire at Manchester
Dr. Michael Jonas, University of New Hampshire at Manchester

Faculty Posters (continued)

11. **A Multi-User Tabletop Display With Enhanced Mobile Visuals For Teaching And Collaborative Training**

Alvaro Uribe, University of Ontario Institute of Technology (UOIT)

Bill Kapralos, York University and UOIT

Andrew Hogue, UOIT

Kamen Kanev, York University, UOIT, Shizuoka University

Michael Jenkin, York University and Shizuoka University

Reneta P. Barneva, SUNY Fredonia

12. **Just Enough Programming for Eight-years Olds** (encore presentation of SIGCSE 2015 poster <http://dl.acm.org/citation.cfm?id=2691899>)

Karen H. Jin, Science & Technology Division, University of New Hampshire at Manchester

Gavin Kearns, Paul Elementary School, Wakefield, NH

The Keynote Speakers

Doctrines and Laws for Cybersecurity

Fred B. Schneider, Cornell University

With increasing dependence on networked computing systems comes increasing vulnerability. The vulnerabilities are mostly technical in origin, but remediations need not be. Only by coupling technical insights with public policy do we stand a good chance to create a safer and more secure cyberspace. This talk will survey the landscape, discuss why past doctrines have failed, propose a new doctrine of Public Cybersecurity, and advocate for scientific laws that move beyond today's reactive approach to attacks.

Biography

Fred B. Schneider is the chairman and Samuel B. Eckert Professor of Computer Science at Cornell, where he has been on the faculty since 1978. Schneider's research concerns trustworthy systems, most recently focusing on computer security. He was the editor of "Trust in Cyberspace" which reports findings from the US National Research Council's study committee on information systems trustworthiness that Schneider chaired. A fellow of the AAAS, ACM, and IEEE, Schneider was awarded a D.Sc. [honoris causa] by the University of Newcastle-upon-Tyne in 2003. His survey paper on state machine replication received a SIGOPS Hall of Fame Award in 2007. He received the 2012 IEEE Emanuel R. Piore Award for "contributions to trustworthy computing through novel approaches to security, fault-tolerance and formal methods for concurrent and distributed systems". And he was elected to membership of the US National Academy of Engineering (NAE) and to its Norwegian counterpart (NTV).

Schneider is a member of the board for the Computing Research Association, the NRC Computer Science telecommunications Board (CSTB) and NRC Naval Studies Board (NSB), and he is the founding chair of NRC Forum on Cyber-Resilience. He served on the Pentagon's Defense Science Board (DSB) and continues to serve on various task forces.

The Keynote Speakers (continued)

PS-PD-PR: Problem Solving, Program Design, and Peer Review **Shriram Krishnamurthi, Brown University**

In typical programming assignments, students are given a task and asked to turn in solutions. There are few intermediate deliverables or artifacts, and there is a corresponding lack of tools to assess student understanding of the problem itself. This is analogous to checking an architect's work only after they pull the shroud off of a completed building.

I will discuss a scaffolded design methodology that combats these problems. It:

- helps nervous students get started on assignments
- provides a debugging aid when students run into difficulties
- addresses long-standing problems of transfer from computing to math
- enables peer-review, making education both social and cooperative
- connects to principles and practices in other design disciplines

I will also discuss practical, complementary tool support that enables instructors to easily incorporate peer review techniques in their courses.

Joint work with Joe Gibbs Politz (Brown), Benjamin Lerner (Northeastern), Emmanuel Schanzer (Bootstrap), Kathi Fisler (WPI), Matthias Felleisen (Northeastern), Matthew Flatt (Utah), Robby Findler (Northwestern), Joe Collard (UMass Amherst), and Arjun Guha (UMass Amherst).

Biography

Shriram Krishnamurthi is a Professor of Computer Science at Brown University. With collaborators and students, he has created several influential systems: DrRacket and WeScheme (programming environments), Margrave (access control policy analyzer), FrTime and Flapjax (reactive programming languages), LambdaJS and TeJaS (semantics and types for JavaScript), and Flowlog (software-defined networking programming language and verifier). He is now working on the Pyret programming language. He is the author of *Programming Languages: Application and Interpretation* and a co-author of *How to Design Programs* and *Programming and Programming Languages*. He co-directs the Bootstrap math-and-computing outreach program. He won SIGPLAN's Robin Milner Young Researcher Award, and Brown's Henry Merritt Wriston Fellowship for distinguished contribution to undergraduate education. He has authored twelve papers recognized for honors by program committees.

Programming Contest Teams

Bloomsburg University of Pennsylvania
Bridgewater State University
Central Connecticut State University
Chestnut Hill College
Clark University
Colgate University
Edinboro University
Fitchburg State
Framingham State University
Hamilton College
Jamestown Community College
MassBay Community College
Merrimack College
Middlebury
Pace University
Pennsylvania College of Technology
Plymouth State University
Saint Anselm College
Siena College
St. John's University
St. Lawrence University
SUNY Fredonia
SUNY Oneonta
The College at Brockport: State University of New York
The College of Saint Rose
UHN Manchester
University of New Haven
Wellesley College
Wheaton College
Widener University
Worcester State

Reviewers

Kevin McCullen, SUNY Plattsburgh
Sofya Poger, Felician College
David Shaffer, Westminster College
Robert Noonan, College of William and Mary
John Vaughn, Hobart & William Smith Colleges
Adrienne Decker, Rochester Institute of Technology
Ying Liu, St. John's University
Zachary Kissel, Merrimack College
Christopher Merlo, Nassau Community College
Rebecca Thomas, Bard College
Choong-Soo Lee, St. Lawrence University
Carol Hurwitz, Manhattan College
Jonathan Blake, Quinnipiac University
Barbara Bracken, Wilkes University
Alfreda Dudley, Towson University
Seikyung Jung, Associate Professor
T.M. Rao, The College at Brockport
Joan Lucas, The College at Brockport
Dan DiTursi, Siena College
Alisa Neeman, University of Rio Grande
Seth Freeman, Capital Community College
Christopher Stuetzle, Merrimack College
Lubomir Ivanov, Iona College
Eileen Peluso, Lycoming College
Linda Null, Penn State University
David Voorhees, Le Moyne College
Daniel Rogers, The College at Brockport
Jeff Martens, University of Maryland, Baltimore County
S Maniccam, Eastern Michigan University
Carson McCullers, Dutchess Community College
Warren Carithers, Rochester Institute of Technology
Lawrence D'Antonio, Ramapo College
Brian O'Neill, Western New England University
Mary Courtney, Pace University
Delbert Hart, SUNY Plattsburgh
Bruce Tis, Simmons College
Michael Jonas, UNH Manchester
Ed Harcourt, St. Lawrence University
Susan Imberman, The College of Staten Island

Reviewers (continued)

Darren Lim, Siena College

Aparna Mahadev, Worcester State University

Sandeep Mitra, The College at Brockport

Ingrid Russell, University of Hartford

Shamsi Moussavi, MassBay Community College