



The 4th Annual Conference  
on Integrated Computing and  
STEM Education  
Sunday, November 9, 2014  
UC Davis Conference Center

# Igniting Genius

Lighting the *Spark* for All

**UCDAVIS**  
**C-STEM CENTER**  
[c-stem.ucdavis.edu](http://c-stem.ucdavis.edu)

# About

Welcome to the 4th Annual Conference on Integrated Computing and STEM Education!

The conference provides a forum for K-14 STEM educators, researchers, policy makers and industrial partners to discuss and influence the future direction of integrated computing and STEM education.

This year's theme, **"Igniting Genius, Lighting the Spark for All"**, is a reflection of the Center's overarching goals:

- To close the achievement gap by broadening participation of students traditionally underrepresented in computing and STEM subjects
- To develop students' computer-aided problem-solving skills through engagement in real-world STEM problems.

Through this conference, we hope to inspire and further advance collaboration among K-14 teachers, researchers, policy makers and industry partners to continue our progress and achieve these two goals.

The UC Davis Center for Integrated Computing and STEM Education (C-STEM) is hosting this important event in partnership with the California Department of Education and partner county offices of education. Funding is provided by the National Science Foundation.

## Conference Planning Committee

Ronda Adams, Associate Superintendent, Yolo County Office of Education

Debora Bruns, CaMSP C-STEM+ Project Director, Yolo County Office of Education

Harry H. Cheng, Professor and C-STEM Center Director, UC Davis

Mike Hardwick, Senior Manager, Sandia National Laboratories

Heidi Espindola, C-STEM Program Manager, UC Davis

Merry Kim, Coastline ROP, Orange County

Garth Lewis, Director of Secondary Education, Woodland Joint Unified School District

Ryan Mangan, C-STEM Education Specialist, UC Davis

Rex Schrader, RoboPlay Competition Head Judge, Engineer, Hewlett Packard Company

Joe Stymeist, CTE Coordinator, Sacramento City Unified School District

## Message from C-STEM Center Director

The successful implementation of the Common Core State Standards and the Next Generation Science Standards hinges on the creation and integration of authentic, project-based learning experiences that require students to engage in real-world problem solving. Inspired by this challenge, the 4th annual Conference on Integrated Computing and STEM Education offers educators, researchers and policy makers the opportunity to learn more about integrated computing and STEM education and the resources available through the C-STEM Center.

C-STEM partner teachers, their district and school administrators, as well as researchers, educators, policy makers and industrial partners will share their experiences, best practices, and ideas on integrated computing and STEM education in breakout sessions. The conference offers a first-hand opportunity to examine the groundbreaking work of the C-STEM Center on integrated computing and STEM education in formal, after school, and informal settings.

During the Conference we will be recognizing outstanding STEM teachers with the C-STEM Teacher of the Year Award for their exceptional contributions in teaching computing, integrating computing into STEM subjects, and inspiring students to pursue careers and post-secondary study in C-STEM fields. C-STEM volunteers will also be recognized for their service to the C-STEM program with the C-STEM Service Award for their outstanding performance, effective leadership, prolonged and committed service, devotion, enthusiasm, and faithfulness.

Join us in meeting the challenge of closing the achievement gap, and preparing all students to be college and career-ready.

— Harry H. Cheng

## Conference Highlights

- Keynote Address on **“The Shining Shifting State of STEM”** by Karen Shores, Administrator, STEM Office of the California Department of Education
- Keynot Address on **“HP: Built on C-STEM”** by Hossein Saadat, Vice President Global Supply Chain, Hewlett Packard
- Lunch Address on **“Building the Funnel for the Hi-tech Workforce”** by Steve Wright, Director & Sector Navigator, ICT & Digital Media, California Community Colleges

# Keynote Speakers

8:40 - 9:00 AM

## **“The Shining Shifting State of STEM”**

Karen Shores

*Administrator*

*STEM Office California Department of Education*

Karen Shores is the Administrator of the Science, Technology, Engineering, and Mathematics (STEM) Office at the California Department of Education. In this capacity, Mrs. Shores oversees programs and initiatives related to science education and the Next Generation Science Standards, mathematics education and the Common Core State Standards in mathematics, environmental education, STEM education, physical education, and the California Math and Science Partnerships. Also at the California Department of Education Karen has managed the statewide California Partnership Academies program and was responsible for the energy and utilities industry sector. In public education she has served as assistant principal, district assessment coordinator, grant writer, categorical programs coordinator, homeless and foster youth liaison, substance abuse prevention coordinator, academy coordinator, school nurse, and health careers educator. Prior to her career in education, Karen enjoyed a career as a registered nurse in acute care and public health.



9:00 - 9:20 AM

## **“HP: Built on C-STEM”**

Hossein Saadat

*Vice President, Global Supply Chain*

*Hewlett-Packard Company*



Hossein joined HP in November 2013. He is responsible for all aspects of operations within RVC, ODM, and CM partners to meet or exceed customer expectations on quality, delivery, cost, and services. Over the last 25 years, Hossein has held global executive positions in general management, engineering, operations, and supply chain among the following companies:

- Solectron – Vice President, Worldwide Operation in mechanical, system Integration
- Sonim – Chief Operation Officer, World’s most ruggedized voice over IP wireless communication
- Sanmina – President ESD, SVP MSD

Before his high tech career, Hossein was a professor of applied mathematics. Hossein has a B.S. in Mechanical Engineering and an M.S. in Applied Mathematics. Hossein is located at the Palo Alto campus.

# Lunch Speaker

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12:20 - 1:20 PM

## **“Building the Funnel for the Hi Tech Workforce”**

Steve Wright

*Director & Sector Navigator*

*ICT & Digital Media, California Community Colleges*

Steve Wright is a veteran communications technology executive specializing in market strategy, economic and business development. Steve’s current role as California Statewide Director Information and Communication Technologies/Digital Media (ICT/DM – Sector Navigator) in the Doing What Matters program allows him to combine his business experience with the California Community College system to meet the human resource needs of hi-tech workforce.

Steve has released a series of videos that describe how his team (10 DSNs by region) can work together High school staff (including counselors) interested in better articulating high school courses and improve student outcomes through aligned pathways that focus on regional employment opportunities.

Steve holds an MBA, Pepperdine, an MS Telecommunications, SMU, and a Project Management Professional certification. Steve lives in Thousand Oaks, CA with his wife and children.





# Conference Sessions

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Session 1 & 2

Ballroom A

## *Common Core, NGSS and UC/CSU Preparation and A-G Requirements through C-STEM*

As the new Common Core State Standards and Next Generation Science Standards change teaching pedagogy and student's interaction with subject matter, the need for relevance and rigor has increased. In this session teacher panelist will describe and model how they use C-STEM curriculum to address this need while also meeting A-G requirements for UC/CSU preparation, providing attendees with a peek inside math and science classrooms, grades 5-12.

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Session 1 & 2

Conference Room A

## *Outside the Classroom: Integrating C-STEM in Informal Education*

After school and summer programs allow students to explore material that can't be covered in the traditional 8-3 school day. C-STEM curriculum provides students with academic rigor while also enriching collaborative and 21st century skills. This session will delve into the available resources which attract underrepresented groups into STEM field, including standards based extension activities which allow for preparation for the RoboPlay Competition on C-STEM Day and provide support for core classes.

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Session 1 & 2

Ballroom B

## *Digital Media and Language Arts through C-STEM Computing and Robotics*

Incorporating digital media and language arts is an enticement for many students to participate in STEM activities. Many students are not initially attracted to STEM because of preconceptions regarding the field. Experienced teachers will show winning videos and take you through key steps of a robotic video creation, illustrating the connection between English language arts, digital media and traditional STEM subjects through C-STEM computing and robotics program as well RoboPlay Video Competition. Best practices, successes and challenges will be shared from plot conception, story and character development, choreography, soundtrack, robotic programming and 3D design, video production and editing.

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Session 1

Conference Room B

## *Industry Pipeline: C-STEM for CTE/ROP and Career Pathways Digital Media and Language Arts through C-STEM Computing and Robotics*

Collaboration between K-12 and industry is crucial to ensure students are being prepared properly to enter the workforce. In this session, a panel of industry partners as well as the CTE/ROP teachers and administrators discuss their experience through C-STEM A-G elective computing and robotics courses. These educators and industry partners will discuss the key skills that K-12 educators should emphasize to ensure their students will be competitive in today's careers, how to integrate those through C-STEM A-G standards based curriculum, and ways of building partnership with industry to bring industry perspective into the classroom. They will describe how they see C-STEM curriculum fulfilling that need as well as what improvements still need to be made in CTE/ROP courses and pathways.

### *C-STEM School, District, and County-wide Implementation*

Administrators of all levels are encouraged to attend this session to learn how the C-STEM program can be implemented at their school sites. 2013/2014 was the first year C-STEM was implemented district wide and the first year C-STEM Day was held outside of UC Davis through a county wide pilot in Orange County. Community college, county office, district and school site educators will describe their experience from starting the project with initial interest to teacher training, implementation and teacher support and the culminating event, C-STEM Day. Funding sources and coordination between existing STEM/CTE efforts will be discussed.

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### *C-STEM in action! Student Activities for Integrating Algebra and Computer Programming*

Observe or participate in an Algebra 1 / Integrated Math 1 programming lesson! Come see what your students would experience as C-STEM teachers complete differentiated programming tasks that attend to specific mathematics objectives. Features of the C/C++ interpreter Ch used in the C-STEM curriculum are discussed in their relation to specific math topics. Teaching resources such as power-points, group activities and robotics activities are presented to showcase how computer programming can support math instruction in alignment with Common Core. Teacher participants must bring their own Windows or Mac OS X laptops with software pre-loaded and must have attended a prior C-STEM training.

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### *RoboPlay Challenge Competition in action! Hands-on Demonstration for Integrating Robotics and CTE*

Join our mini C-STEM Day RoboPlay Challenge Competition! See what your students would experience this May 30th! Participants will be given mini challenges and compete in 10 minute rounds. As participants prepare with their team, observers will be given an overview of the format and expectations of the competition. When our mini competition begins, observers will interact with the teacher teams, witnessing the successes and challenges students will face. Teacher team participants must bring their own Windows laptop (no Mac OS X laptop) with software pre-loaded. Teacher team participants must have attended a prior C-STEM training with Linkbot. Teams will be formed on the spot.

# Conference Schedule

Time	Event	Location
8:00 - 8:30 AM	Registration and Breakfast	UC Davis Conference Lobby
8:30 - 8:40 AM	Welcome and Introductions <ul style="list-style-type: none"> <li>• Dr. Harry Cheng, Professor and C-STEM Center Director</li> <li>• Dr. Enrique Lavernia, Dean of the College of Engineering, UC Davis</li> </ul>	UC Davis Conference Center Ballroom A, B, C
8:40 - 9:00 AM	Keynote Address: <b>"The Shining Shifting State of STEM"</b> <ul style="list-style-type: none"> <li>• Karen Shores, STEM Administrator, California Department of Education</li> </ul>	UC Davis Conference Center Ballroom A, B, C
9:00 - 9:20 AM	Keynote Address: <b>"HP: Built on C-STEM"</b> <ul style="list-style-type: none"> <li>• Hossein Saadat, Vice President of Hewlett-Packard Company</li> </ul>	UC Davis Conference Center Ballroom A, B, C
9:20 - 9:40 AM	Plenary Address: <b>"Challenges and Research Issues on Integrated Learning of Computing and STEM"</b> Dr. Harry H. Cheng, C-STEM Center Director and Professor	UC Davis Conference Center Ballroom A, B, C
9:40 - 10:00 AM	Award Presentation: <ul style="list-style-type: none"> <li>• C-STEM Teacher of the Year Award</li> <li>• C-STEM Service Award</li> </ul> Presenters: <ul style="list-style-type: none"> <li>• Dr. Harry H. Cheng, C-STEM Center Director and Professor</li> <li>• Dr. Enrique Lavernia, Distinguished Professor and Dean of the College of Engineering, UC Davis</li> <li>• Mike Hardwick, Senior Manager, Deputy Director Advanced Weapon Systems Engineering, Sandia National Laboratories</li> </ul>	UC Davis Conference Center Ballroom A, B, C
10:00 - 10:10 AM	Coffee Break	
10:10 - 11:10 AM	Breakout Session 1	



Time	Event	Location
Session 1A	<p><b>Common Core, NGSS and UC/CSU Preparation and A-G Requirements through C-STEM</b></p> <ul style="list-style-type: none"> <li>• Chair: Winfred Roberson, Superintendent, Davis Joint Unified School District</li> <li>• Co-Chair: Matt Turkie, Principal, School of Engineering and Sciences</li> </ul> <p>Presenters:</p> <ul style="list-style-type: none"> <li>• Ben Gonzales, Yuba City School District</li> <li>• Clay Dagler, Luther Bank High School</li> <li>• Mafe Aguilar, California Middle School</li> </ul>	Ballroom A
Session 1B	<p><b>Outside the Classroom: C-STEM in Informal Education</b></p> <ul style="list-style-type: none"> <li>• Chair: Raymond Burnell, Executive Director, Powerhouse Science Museum</li> <li>• Co-Chair: Andee Press-Dawson, Director of Community Programs and Events, University of California, Davis</li> </ul> <p>Presenters:</p> <ul style="list-style-type: none"> <li>• Susan Johnston, Livermore High School</li> <li>• Muntaha Samad, University of California, Davis</li> <li>• Yassi Motamed and Terry Kling, TeWinkle Middle School</li> </ul>	Conference Room A
Session 1C	<p><b>Digital Media and Language Arts through C-STEM Computing and Robotics</b></p> <ul style="list-style-type: none"> <li>• Chair: Mike Hardwick, Senior Manager, Deputy Director Advanced Weapon Systems Engineering, Sandia National Laboratories</li> <li>• Co-Chair: Angela Cheer, Professor of Mathematics, University of California, Davis</li> </ul> <p>Presenters:</p> <ul style="list-style-type: none"> <li>• Dylan Besk, School of Engineering and Sciences</li> <li>• Gavin Williams, Luther Burbank High School</li> <li>• Francesca Reinhard, TR Smedberg</li> </ul>	Ballroom B
Session 1D	<p><b>Industry Pipeline: C-STEM for CTE/ROP/Career Pathways</b></p> <ul style="list-style-type: none"> <li>• Chair: Sheryl Ryder-Burns, Executive Director of Career Development, Placer County Office of Education</li> <li>• Co-Chair: Mike Woodcock, Principal, Riverbank Elementary School</li> <li>• Co-Chair: Graham Ryland, President, Barobo Inc.</li> </ul>	Conference Room B

Time	Event	Location
	Presenters: <ul style="list-style-type: none"> <li>• Ed Woodworth, Livermore High School</li> <li>• Dubarrie Fagout, River City High School</li> <li>• Paul Akuna, Franklin High School</li> </ul>	
Session 1E	<p><b>C-STEM in Action! Student Activities for Integrating Algebra and Computer Programming</b></p> Presenters: <ul style="list-style-type: none"> <li>• Ryan Mangan, C-STEM Education Specialist</li> <li>• Judy Tan, River City High School</li> </ul> C-STEM Fellow Coach: <ul style="list-style-type: none"> <li>• Carmen Wright, Elkhorn Village Elementary School</li> </ul>	Ballroom C
11:10 - 11:20 AM	Coffee Break	
11:20 - 12:20 PM	Breakout Session 2	
Session 2A	<p><b>Common Core, NGSS and UC/CSU Preparation and A-G Requirements through C-STEM</b></p> <ul style="list-style-type: none"> <li>• Chair: Carrie Roberts, Director, Professional Learning Support Division, California Department of Education</li> <li>• Co-Chair: Lisa Smith, Principal, Elkhorn Village Elementary School</li> </ul> Presenters: <ul style="list-style-type: none"> <li>• Clay Dagler and Gavin Williams, Luther Burbank High School</li> <li>• Tim Keys, Pine Grove Elementary</li> <li>• Mafe Aguilar, California Middle School</li> </ul>	Ballroom A
Session 2B	<p><b>Outside the Classroom: C-STEM in Informal Education</b></p> <ul style="list-style-type: none"> <li>• Chair: Dr. Clark Bryant, Associate Superintendent of Instructional Services, Davis Joint Unified School District</li> <li>• Co-Chair: Kristen Witt, Principal, Fairfield High School</li> </ul> Presenters: <ul style="list-style-type: none"> <li>• Susan Johnston, Livermore High School</li> <li>• Muntaha Samad, University of California, Davis</li> <li>• Judy Tan, River City High School</li> </ul>	Conference Room A

Time	Event	Location
Session 2C	<p><b>Digital Media and Language Arts through C-STEM Computing and Robotics</b></p> <ul style="list-style-type: none"> <li>• Chair: Gary Page, Information Technology Consultant, California Department of Education</li> <li>• Co-Chair: Patrick Bohman, Vice Principal, School of Engineering and Sciences</li> </ul> <p>Presenters:</p> <ul style="list-style-type: none"> <li>• Carmen Wright, Elkhorn Village Elementary School</li> <li>• Francesca Reinhard, TR Smedberg</li> <li>• Paul Akana, Franklin High School</li> </ul>	Ballroom B
Session 2D	<p><b>C-STEM School, District, County-wide Implementation</b></p> <ul style="list-style-type: none"> <li>• Chair: Garth Lewis, Director of Secondary Education, Woodland Joint Unified School District</li> <li>• Co-Chair: John Dahlgren, Curriculum Specialist, Butte Community College</li> </ul> <p>Panelists:</p> <ul style="list-style-type: none"> <li>• Merry Kim, Coastline ROP</li> <li>• James Town, Alameda County Office of Education</li> <li>• Virginia Lehmkuhl-Dakhwe, Director of the STEM Education Program, San Jose State University</li> <li>• Matt Turkie, Principal, School of Engineering and Sciences</li> </ul>	Conference Room B
Session 2E	<p><b>RoboPlay Challenge Competition in Action! Hands-On Demonstration for Integrating Robotics and CTE</b></p> <p>Presenters:</p> <ul style="list-style-type: none"> <li>• Ryan Mangan, C-STEM Education Specialist</li> <li>• Dylan Besk, School of Engineering and Sciences</li> </ul> <p>C-STEM Fellow Coach:</p> <ul style="list-style-type: none"> <li>• Wendy Jennings, Luther Burbank High School</li> </ul> <p>C-STEM RoboPlay Judges:</p> <ul style="list-style-type: none"> <li>• Rex Schrader, HP Engineer</li> <li>• Roger Nattkemper, Engineer</li> </ul>	Ballroom C
12:20 - 1:20 PM	<p>Lunch</p> <p>Featured Speech: <b>“Building the Funnel for the Hi-Tech Workforce”</b></p> <ul style="list-style-type: none"> <li>• Stephen Wright, Director &amp; Sector Navigator, ICT and Digital Media, California Community Colleges</li> </ul>	UC Davis Conference Center Ballroom A, B, C
1:20 - 2:00 PM	Networking	UC Davis Conference Center Ballroom A, B, C

# C-STEM Teachers of the Year



Ben Gonzales  
*Douglass Middle School  
Woodland USD*



Paul Akuna  
*Franklin High School  
Elk Grove USD*



Yassi Motamed  
*TeWinkle Middle School  
Newport Mesa USD*



Terry Kling  
*TeWinkle Middle School  
Newport Mesa USD*



Susan Johnston  
*Livermore High School  
Livermore USD*



Carmen Wright  
*Elkhorn Village Elementary School  
Washington USD*

# C-STEM Service Award



Merry Kim  
*Coastline ROP  
Orange County  
C-STEM Regional Coordinator*



Rex Schrader  
*Product Engineer  
Hewlett - Packard Company  
Head RoboPlay Competition Judge  
2014 C-STEM Day*



Roger Nattkemper  
*Electrical Engineer  
Head RoboPlay Video Judge  
2014 C-STEM Day*

# Conference Parking & Building Location

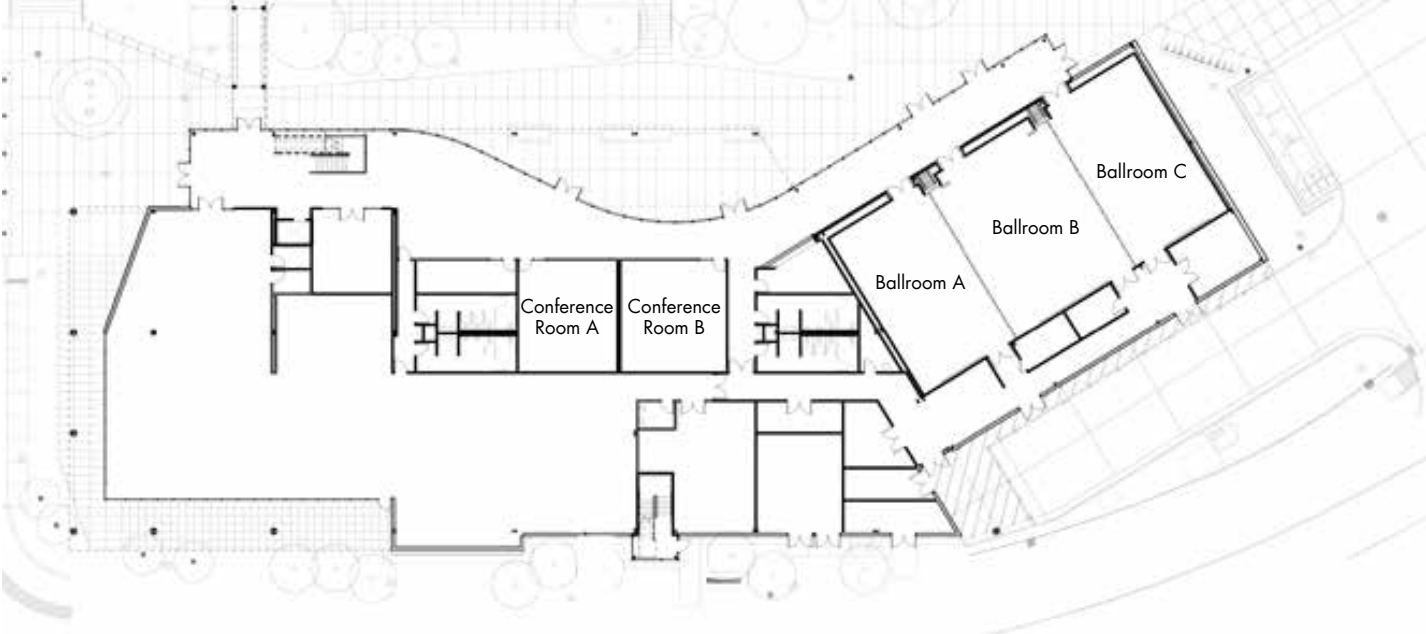


★ Conference Center

★ Parking



# UC Davis Conference Center Layout



## Notes:

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# Sponsors



## UC DAVIS C-STEM Center

### UC Davis Center for Integrated Computing and STEM Education

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