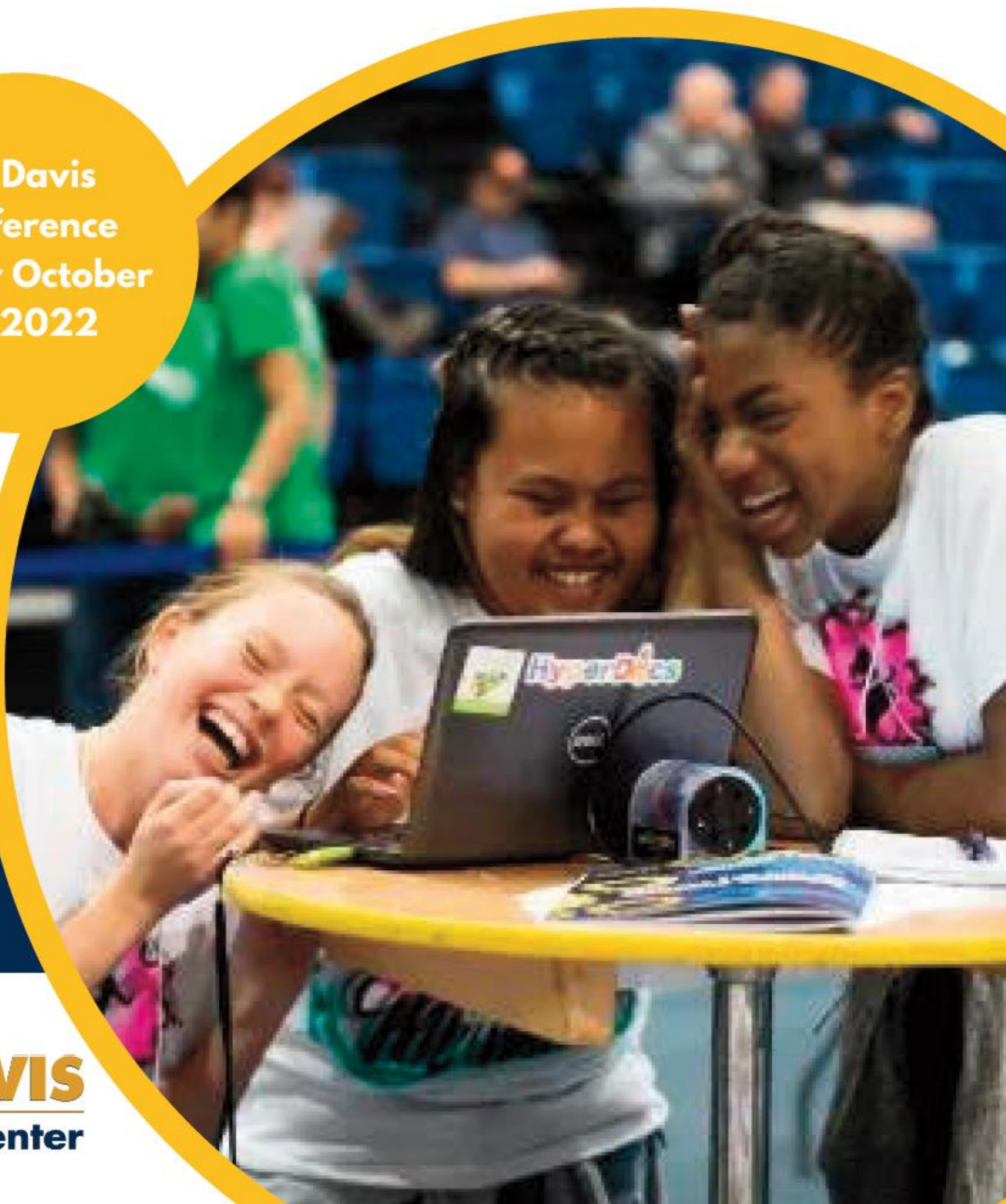# 12 Annual Conference on Integrated Computing and STEM Education

Integrated Math and CS Education with Equity and Social -Emotional Learning for All Students

UC Davis Conference Center October 21, 2022

UCDAVIS
C–STEM Center

Message from the C-STEM Center Director

Dear C-STEM Conference Attendees,

The UC Davis C-STEM Center is pleased to organize the 12th Annual Conference on Integrated Computing and STEM Education on Friday October 21, 2022 at the UC Davis Conference Center. Explore engaging solutions to challenges in STEM education, learn from fellow teachers, and discover ground-breaking strategies for reaching ALL students and better preparing them for post-secondary education and careers. The theme of this 12th anniversary conference is "Integrated Math and CS Education with Equity and Social-Emotional Learning for All Students." The schedule is packed with inspiring speeches and hands-on sessions about transforming math, CS, and CTE education with coding and robotics.

We are very pleased to have Dr. Renetta Garrison Tull, Vice Chancellor of Diversity, Equity and Inclusion at UC Davis, for our keynote dialogue on Diversity, Equity, and Inclusion in Building the STEM Talent Pipeline. Lisette Estrella-Henderson, County Superintendent of Schools for the Solano County Office of Education, will be our moderator.

We will also feature several plenary speeches. Mauricio Arellano, Superintendent of the Redlands Unified School District, and Deepika Srivastava, STEAM & Innovation Coordinator for Redlands USD, will tell us about the incredible Redlands Success Story on Achieving 10% Higher Math Scores for C-STEM Students, moderated by Dr. Suzie Dollesin, Education Programs Consultant for the California Department of Education.

Dr. Alfonso Jiménez, Superintendent of Schools for the Hacienda La Puente Unified School District, will speak on Integrating Coding and Robotics into Math Education – Our Journey, Our Story to Prepare Students for Careers Today.

And in our Lunch Plenary Panel Session, Dr. Monica K. Makiewicz, Associate Superintendent of Teaching and Learning for the Fontana Unified School District, Joe Erven, Executive Director of Innovation and Excellence for the Orange Unified School District, Jennie Dyerly, Principal in the Redlands Unified School District, and Tim Keys, 5th Grade Teacher in the Amador Unified School District, will discuss the topic of Integrated Math and CS Education with Equity and Social-Emotional Learning for All Students. Dr. Eduardo Mosqueda, Associate Professor in the Department of Education at UC Santa Cruz, will moderate.

Breakout sessions throughout the day will provide administrators and teachers opportunities to learn strategies for integrating the C-STEM Math-ICT Curriculum into K-12 education at both the elementary and secondary levels. In addition, several sessions will provide hands-on opportunities for teachers to gain more experience with the software and hardware used to integrate coding and robotics into their math and STEM courses.

The C-STEM program continues to inspire all students through exciting, hands-on, interdisciplinary curriculum with a focus on math with coding and robotics; we encourage you to take advantage of the strategies and resources presented today to enhance creative problem solving with robotics in your classrooms and beyond.

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

Conference Location:
UC Davis Conference Center
540 Alumni Ln, Davis, CA 95616

Maps, WiFi, and Linkbot Software Information: See inside back cover.

C-STEM Math-ICT Curriculum

http://c-stem.ucdavis.edu/curriculum

C-STEM (Computing, Science, Technology, Engineering, and Mathematics) is a UC Approved Educational Preparation Program for Undergraduate Admission for both K-12 and Community College students to all UC campuses. The A-G approved C-STEM courses at the UCOP web site can readily be added in a high school's A-G course list. The C-STEM Math-ICT Curriculum provides students with 13 years of experience learning math with coding and robotics. Integrating coding and robotics into math education facilitates an engaging, rigorous course that promotes critical thinking and creative problem solving. Many students who take C-STEM courses have fun learning without associating the course with their struggles in a traditional math class. This unique hands-on approach provides students with the application-based learning they need to gain a thorough understanding of the materials.

RoboPlay for Engagement and Project-Based Learning

http://c-stem.ucdavis.edu/roboplay/roboplay-competition

RoboPlay Competitions are theme-based level playing field robotics competitions for students in grades 5-12. The competitions are designed to engage students in project-based team activities and allow them to showcase their accomplishments and creativity. The competition arena and specific challenges are unknown to participants until the day of the competition. Using their math, programming, and problem solving skills, student teams try to most efficiently obtain the highest score for each task on their own. Schools and districts can host their own competitions using C-STEM resources.

Afterschool and Summer Robotics Camps for Accelerated Math Learning

http://c-stem.ucdavis.edu/robotics-camp

C-STEM Afterschool and Summer Robotics Camps for Accelerated Math Learning are designed for our school and district partners to host for their students locally. The camps are designed in five grade bands and focus on the cognitive and socio-emotional aspects of learning, alleviating some of the distress caused by the pandemic and bringing fun back to learning. They empower K-12 students for accelerated and deeper math learning through robotics projects and the solution of real-world problems using math concepts, and at the same time provide students with recreational and teamwork opportunities with peer mentoring. Each C-STEM Robotics Camp is focused on learning key math concepts in the related grade levels through collaborative robotics. The C-STEM Robotics Camp curricula engage students in hands-on learning of **math,** seamlessly integrated with **coding, engineering, science, art,** and **music** via **robotics**. The campers will also learn teamwork, communication, presentation, and leadership skills.

Girls in Robotics Leadership (GIRL/GIRL+) Summer Camps and Ujima GIRL Project

http://c-stem.ucdavis.edu/girl, http://c-stem.ucdavis.edu/ujima

C-STEM's GIRL Camp is a week-long summer program geared for girls entering 7th and 8th grade. This camp targets girls at a critical stage in their development when most girls lose interest in STEM. GIRL Camp aims to foster their interest in STEM subjects through peer mentoring and engaging hands-on coding and robotics activities. GIRL Camps facilitate a positive environment to explore science and technology beyond the classroom while boosting confidence and self-esteem through group projects and presentations. Campers are inspired to serve as leaders and role models to other young girls and encouraged to create and join robotics clubs in their schools. High school girls entering 10th, 11th, and 12th grade can benefit from the C-STEM GIRL+ Camps, which are specifically designed to motivate high school girls to pursue higher education in STEM fields. GIRL+ provides an in-depth look into more advanced coding and physical computing with Arduino and robotics.

The $2.4M Ujima (Collective Work and Responsibility) Girls in Robotics Leadership (GIRL) Project, funded by the NSF, aims to address the significant challenges of inclusion and equity for Black/African American middle school and high school girls in STEM education. More than 2,000 Black girls will be nurtured through this project, which uses hands-on coding and robotics as an engaging and fun vehicle for increasing positive attitudes toward STEM, and developing leadership skills for Black girls in middle school and high school through peer-mentoring with Black college female students. The project is a three-year collaborative effort between the C-STEM Center, the Umoja Community Education Foundation and affiliated California community colleges, industry partners, and county offices of education and school districts in California.

Conference Schedule

Time & Room	Event
7:45 – 8:30 am Lobby	**Registration and Coffee**
8:30 – 8:40 am Ballrooms A, B, C	**Welcome**
8:40 – 8:50 am Ballrooms A, B, C	**C-STEM Update** Dr. Harry Cheng, Professor & C-STEM Center Director, UC Davis
8:50 – 9:10 am Ballrooms A, B, C	**Keynote Dialogue: Diversity, Equity, and Inclusion in Building the STEM Talent Pipeline** Speaker: Dr. Renetta Garrison Tull, Vice Chancellor of Diversity, Equity and Inclusion, UC Davis Moderator: Lisette Estrella-Henderson, County Superintendent of Schools, Solano County Office of Education
9:10 – 9:30 am Ballrooms A, B, C	**Plenary Address: Redlands Success Story on Achieving 10% Higher Math Scores for C-STEM Students** Speakers: Mauricio Arellano, Superintendent, and Deepika Srivastava, STEAM & Innovation Coordinator, Redlands Unified School District Moderator: Dr. Suzie Dollesin, Education Programs Consultant, California Department of Education
9:30 – 10:10 am Ballrooms A, B, C	**Awards Ceremony** Moderator: Jeff Hescox, Education Services Manager, UC Davis C-STEM Center C-STEM Teachers of the Year C-STEM Administrators of the Year C-STEM Superintendent of the Year
10:10 – 10:20 am Ballrooms A, B, C	**Plenary Address:** Integrating Coding and Robotics into Math Education – Our Journey, Our Story to Prepare Students for Careers Today Speaker: Dr. Alfonso Jiménez, Superintendent of Schools, Hacienda La Puente Unified School District
10:20 – 10:35 am	**Break**
10:35 – 11:45 am Session 1A: Ballroom A Session 1B: Ballroom C Session 1C: Ballroom B	**Breakout Sessions 1** **1A: Getting Started with RoboBlocky for Absolute Beginners to Teach Math/CS/STEAM with Robotics** Facilitator: Jeff Hescox, Education Services Manager, UC Davis C-STEM Center **1B: Arduino: Introduction to Basic Electronics and Creative Problem Solving for Physical Computing** Facilitator: Dr. Larry Lagerstrom, Chief Academic Officer, Barobo, Inc. **1C: Strategies for Integrating C-STEM K-12 Math-ICT Curriculum into K-12 Education** Chairs: Dr. Harry Cheng, Professor and C-STEM Center Director, and Dr. Judy Fancher, Assistant Superintendent of Curriculum, Instruction & Assessment, Hacienda La Puente USD Speakers: Rupinder Jagpal, TOSA in charge of C-STEM Implementation, Manteca USD, and Greg Miller, C-STEM Resource Teacher, Orange USD

Conference Schedule

Time & Room	Event
11:45 am – 1:05 pm Ballrooms A, B, C	**Lunch and Plenary Panel Session** Panel Session: Integrated Math and CS Education with Equity and Social-Emotional Learning for All Students (12:25-1:05 pm) Speakers: Dr. Monica K. Makiewicz, Associate Superintendent of Teaching and Learning, Fontana USD, Joe Erven, Executive Director of Innovation and Excellence, Orange USD, Jennie Dyerly, Principal, Redlands USD, and Tim Keys, 5th Grade Teacher, Amador USD Moderator: Dr. Eduardo Mosqueda, Associate Professor, Department of Education, UC Santa Cruz
1:05 – 1:15 pm	**Break**
1:15 – 2:25 pm Session 2A: Ballroom A Session 2B: Ballroom B Session 2C: Ballroom C	**Breakout Sessions 2** **2A: Hands-on Experience for Engaging Students Learning Math with Coding and Robotics** Facilitator: Jeff Hescox, Education Services Manager, UC Davis C-STEM Center **2B: How to Integrate the C-STEM Program with Coding and Robotics into Elementary School Math Education** Chairs: Dr. Ramona Robinson Bishop, Co-Founder and CEO, Elite Public Schools, and Stephen Callahan, Coordinator, Education Technology, STEM Programs, San Joaquin County Office of Education Presenters: Kristy Lindsey, C-STEM Program Manager, UC Davis, Ruth Thompson, 4th Grade Teacher, Redlands USD, and Sandra Soto, 5th Grade Teacher, Travis USD **2C: C-STEM K-12 CS Curriculum, UCD/UCR CS Supplementary Teaching Credential Authorization Program, C-STEM Certification for Teaching Credential Programs at Universities for Pre-Service Teachers** Chairs: Dr. Fred Uy, Director of the Department of Educator & Public School Programs, CSU Office of the Chancellor, and Annette Webb, Director of Education, Academic Affairs, UCR Extension Presenters: Marcey Winawer, Math and CS Teacher, Mountain View Los Altos Union HSD, Deepika Srivastava, STEAM & Innovation Coordinator, Redlands USD, Joanne Chan, Coordinator, Educational Services, Hacienda La Puente USD, and Jesus Esquibel, MSTI Director and Assistant Director, Citizen Scientist Project, CUS Bakersfield
2:25 – 2:40 pm	**Break**
2:40 – 3:40 pm Session 3A: Ballroom A Session 3B: Ballroom B Session 3C: Ballroom C	**Breakout Sessions 3** **3A: CS with Music, Art, Language Arts, Makerspaces: Full STEAM Ahead** Facilitator: Jeff Hescox, Education Services Manager, UC Davis C-STEM Center **3B: How to Integrate the C-STEM Program with Coding and Robotics into Secondary School Math Education** Chairs: Sue Brothers, Assistant Superintendent, Educational Services, Travis USD, and Rupinder Jagpal, TOSA in charge of C-STEM Implementation, Manteca USD Presenters: Michelle Center, Teacher, Redlands USD, Cliff Hilken, CTE Teacher, Elk Grove USD, Paul Sommerfield, Math Department Chair, Elk Grove USD, Judith Tuddao, HS Math Teacher, Manteca USD, and Teresa Sicat, HS Math Teacher, Manteca USD **3C: Expanded Learning: Girls in Robotics Leadership (GIRL/GIRL+) Campas, Ujima GIRL Project, Afterschool and Summer Robotics Camps for Accelerated Math Learning** Chairs: Dr. Teresa Aldredge, Past President, Umoja Education Foundation, and Marcella Grant, Ujima GIRL Program Manager, UC Davis C-STEM Center Speakers: Lilibeth Pinpin, Director, Innovative Programs and Student Success, Solano County Office of Education, Dr. Rosalyn Clark, Targeted Equity Program Specialist, Education Equity Department, Elk Grove USD, Dr. Honey T. Sacro Swem, Elementary Coordinator, Curriculum and Instruction, Fontana USD, and Joanne Chen, Instructional Services Coordinator, Hacienda La Puente USD
3:40 – 4:00 pm Ballrooms A, B, C	**Networking and Raffle** Announcer: Dr. Larry Lagerstrom, Chief Academic Officer, Barobo, Inc.

Dr. Renetta Garrison Tull

Vice Chancellor of Diversity, Equity and Inclusion UC Davis

Dr. Renetta Garrison Tull is Vice Chancellor for Diversity, Equity, & Inclusion at the University of California, Davis. She previously served as Associate Vice Provost for Strategic Initiatives at the University of Maryland, Baltimore County (UMBC) and Professor of the Practice in UMBC's College of Engineering and IT (COEIT). She was the Founding Director and Co-PI for the 12-institution National Science Foundation University System of Maryland's (USM) PROMISE AGEP. Tull earned engineering and science degrees from Howard University and Northwestern University, was an Anna Julia Cooper Postdoctoral Fellow at the University of Wisconsin-Madison and has held faculty positions at the UW-Madison, and the University of Maryland College Park.

The UC Davis Office for Diversity, Equity, and Inclusion has a robust portfolio that includes diversity and inclusion education programming, campus climate, regional community relations, and academic diversity. The office spans both the Davis campus and UC Davis Health and is home to three research centers: the Center for the Advancement of Multicultural Perspectives on Science (CAMPOS), the Center for the Advancement of Multicultural Perspectives on Social Science, Arts, and the Humanities (CAMPSSAH),

and the Center for Reducing Health Disparities (CRHD). The office supports UC Davis's Hispanic Serving Institutions initiative, Anchor Institutions Mission, Principles of Community, and employee resources groups. She also serves on the Advisory Board of the Ujima GIRL Project at the UC Davis C-STEM Center.

An international speaker on global diversity in STEM, Dr. Tull has led discussions around the world on topics such as "Inclusive Engagement – Engineering for All," "Cultivating Inclusive Excellence within Science, Engineering, and Technology," work/life balance, family, and prevention of domestic and work-place abuse. Her recognitions include: O'Reilly Media "Women in Data" cover, Global Engineering Deans Council/Airbus Diversity Award Finalist, and ABET Claire L. Felbinger Award for Diversity. Dr. Tull has more than 50 publications and is a passionate advocate, global mentor, education policy strategist and champion for equity. She has served on consensus committees for mentoring and "Women in COVID -19 for the National Academics of Science, Engineering and Medicine.

Dr. Lisette Estrella-Henderson

Solano County Superintendent of Schools

Keynote Moderator

An innovative thinker and longtime supporter of C-STEM, Lisette motivates her team as well as business and community partners to explore and find solutions to close the achievement gap and provide high quality equitable education to all students.

She has served as an Educator in Solano County for over 36 years. For the past 16 years she worked with the Solano County Office of Education (SCOE) in various roles of increasing responsibility. In January of 2017, she became the first Latina Superintendent of Schools in Solano County's history and only the second woman to hold the position.

Through her extensive knowledge, experience, and leadership abilities, Lisette has earned widespread respect and recognition, including: 2020 Superintendent of the Year (Region 1), California Association of Latino Superintendents and Administrators (CALSA); 2019 C-STEM Administrator of the Year (UC Davis); 2018 Woman of the Year from the 3rd Congressional District; Women in Educational Leadership Award, American Association of School Administrators (AASA); Outstanding Woman Leader Award, ACSA Region 4; Curriculum and Instruction Administrator of the Year, ACSA (chapter, region, and state awards); Woman of Distinction Award, Soroptimist International of Dixon; Community Recognition Award, La Raza Lawyers Association of Solano; Distinguished Educator Award, Dixon Unified School District, and Champions for Children Award, Children's Network of Solano County. She also serves as Member of the Advisory Board for both the UC Davis C-STEM Program and GIRL/GIRL+ Camps Program .

Mauricio Arellano

Superintendent, Redlands Unified School District

Mr. Arellano was appointed Superintendent of the Redlands Unified School District in September of 2017 after an extensive national search. He previously served as an Assistant Superintendent for the Palm Springs USD, the Certificated Director of Personnel, an Elementary Principal, an Elementary Vice-Principal and an Elementary Teacher for the San Bernardino City USD. His recognitions include being named ACSA's Region XIX Personnel/Human Resources Administrator of the Year in 2008, ACSA's Ray Curry Award winner for excellence in school personnel in 2012, the recipient of the 2015 Riverside County Office of Education Models of Excellence Award for his work with the Skillful Leader Program, the 2016 Riverside County Administrator of the Year, and the 2020 C-STEM Superintendent of the Year. He is a member of the UC Davis C-STEM Advisory Board. Since his arrival in Redlands, working in tandem with the Board of Education and all the remarkable employees at RUSD, the District has been focused on implementing a 21st Century learning experience for all students.

Deepika Srivastava

STEAM & Innovation Coordinator, Redlands Unified School District

Deepika is the STEAM & Innovation Coordinator at Redlands Unified School District. She is well known for conceptualizing, planning, and coordinating K-12 STEM programs/pathways in collaboration with community partners to ensure student achievement for the entire spectrum of student needs and strengths to close the opportunity gap for historically underrepresented minorities, with a special focus on girls, multi-language learners, and students with disabilities. She has presented at various state (CA STEAM Symposium, CASE), national (CUE, NCTM, MITScratch) and international level conferences (ISTE2020, ISTE 2022). In 2020 she was a C-STEM Administrator of the Year. She has a Master of Science degree in Physics, Computer Applications and Educational Administration, a Single Subject Teaching Credential in Math, Physics, Chemistry, Introductory Science, administrative credential and over 16 years of professional experience as an educator in the United States and India.

Plenary Speaker

Integrating Coding and Robotics into Math Education – Our Journey, Our Story to Prepare Students for Careers Today

Dr. Alfonso Jiménez

Superintendent, Hacienda La Puente Unified School District

Dr. Alfonso Jiménez has served as Superintendent of the Hacienda La Puente USD since July 2020. The District serves 16,172 TK-12 and 12,000 adult education learners. Dr. Jiménez has 26 years of experience with 19 years in administration serving as assistant principal, principal, director, assistant superintendent, deputy superintendent, and now superintendent. Through his leadership, various programs continue to thrive such as C-STEM, New Pedagogies for Deep Learning (NPDL), visual & performing arts, robotics, and dual immersion. Under his leadership, two schools recently were awarded Schools to Watch at the state and national level. Several schools also earned honors for incorporating civic education. Recently, twenty-eight out of thirty-one schools and the district received the CA Pivotal Practice Awards for innovative teaching strategies implemented during the pandemic. Dr. Jiménez holds a B.S in Physiology from CSU Long Beach, M.S. in Administration from Pepperdine, and Ed.D. in Educational Leadership from the University of Southern California.

1A

E M H B

Getting Started with RoboBlocky for Absolute Beginners to Teach Math/CS/STEAM with Robotics

Facilitator:

Jeff Hescox, Education Service Manager, UC Davis C-STEM Center

Description:

New to C-STEM? Learn how C-STEM is bringing coding and robotics into classrooms and afterschool programs in ways that are engaging all students through hands-on activities and opportunities for personalized learning. RoboBlocky is a web-based drag-and-drop development environment for programming virtual and hardware robots. It is designed to guide absolute beginners through an introduction to solving real-world problems with math, coding, robotics, and logic. Explore thousands of pre-built activities including CCSS-aligned math activities, coding and robotics activities, and detailed projects to bring classroom learning to life. RoboBlocky also prepares students to program in C/C++, the most widely used conventional text-based programming language in industry and college, and it can run in any modern web-browser without installing additional software. Attendees will experience a hands-on introduction to free block-based programming and robotics.

Attendees must bring their own personal computer. Windows and MacOSX users must pre-install Linkbot Labs software from https://barobo.com/download/. Chromebook users must pre-install the Linkbot IDE extension from https://barobo.com/download/. Requirements: Windows 10 or above, MacOSX 10.13 or above, Chromebook with Chrome OS v. 89 or above.
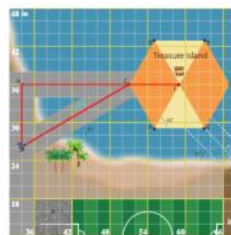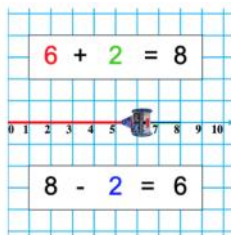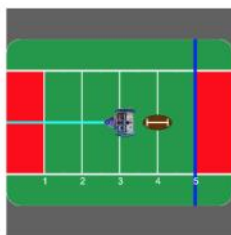
Legend

E   Appropriate for Elementary School

M   Appropriate for Middle School Teachers

H   Appropriate for High School Teachers

A   Appropriate for Administrators

B   BYOD-Bring Your Own Device

(Windows 10 or above, MacOSX 10.13 or above, Chromebook with Chrome OS v. 89 or above)

1B

(E) (M) (H) (B)

Arduino: Introduction to Basic Electronics and Creative Problem Solving for Physical Computing

Facilitator:

Dr. Larry Lagerstrom, Chief Academic Officer, Barobo, Inc.

Description:

Join this hands-on session to get started using Arduino microcontrollers with RoboBlocky. This session will explore an introduction to Physical Computing with Arduino by combining the hands-on projects of physical computing with the simplicity of block-based programming. Discover the endless possibilities of physical computing and how to incorporate modern do-it-yourself electronics into your classroom teaching. Arduino can be integrated into Math, Computer Science, Engineering, and Robotics courses, as well as afterschool programs and summer camps, to facilitate a technologically advanced learning environment.

Attendees must bring their own personal computer. Windows and MacOSX users must pre-install Linkbot Labs software from https://barobo.com/download/. Chromebook users must pre-install the Arduino Controller extension from https://barobo.com/download/. Requirements: Windows 10 or above, MacOSX 10.13 or above, Chromebook with Chrome OS v. 89 or above.

Arduino Uno Starter Kit will be provided by the C-STEM Center.

1C

(E) (M) (H) (A)

Strategies for Integrating C-STEM K-12 Math-ICT Curriculum into K-12 Education

Chairs:

Dr. Harry Cheng, Professor and C-STEM Center Director
Dr. Judy Fancher, Assistant Superintendent of Curriculum, Instruction, & Assessment,
Hacienda La Puente Unified School District

Speakers:

Rupinder Jagpal, TOSA in charge of C-STEM implementation, Manteca USD
Greg Miller, C-STEM Resource Teacher, Orange USD

Description:

C-STEM is a UC Approved Educational Preparation Program for Undergraduate Admission for both K-12 and Community College students to all UC campuses. The 20 A-G approved C-STEM courses at the UCOP website can readily be added in a high school's A-G course list. The C-STEM Math-ICT Curriculum provides students with 13 years of experience learning math with coding and robotics. Integrating coding and robotics into math education facilitates an engaging, rigorous course that promotes critical thinking and creative problem solving.

1C

E M H A

Strategies for Integrating C-STEM K-12 Math-ICT Curriculum into K-12 Education (continued)
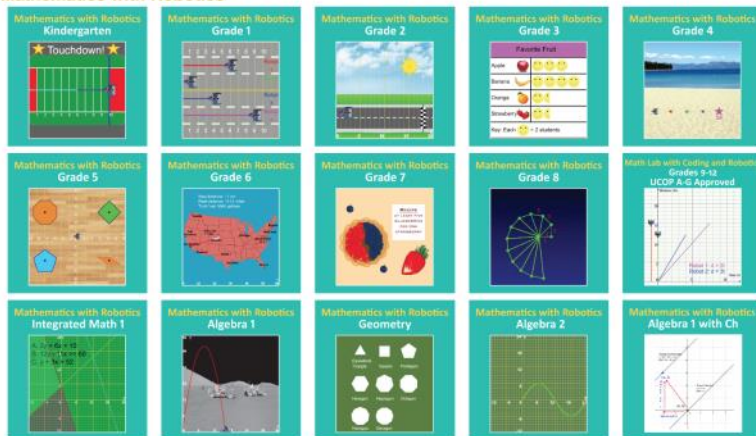
Description:

Many students who take C-STEM Math with Coding and Robotics courses have fun learning without associating the course with their struggles in a traditional math class. This unique hands-on approach provides students with the application-based learning they need to gain a thorough understanding of the materials. Join this session to learn how schools and school districts are implementing the program and closing the achievement gap.

2A

M H B

Hands-on Experience for Engaging Students Learning Math with Coding and Robotics

Facilitator:

Jeff Hescox, Education Service Manager, UC Davis C-STEM Center

Description:

The C-STEM CCSS-compliant Mathematics with Robotics curriculum employs hands-on computing and robotics activities to boost students' interest and engagement in learning math (they learn while having fun!). Students make meaningful connections between abstract math concepts and real-life applications, develop critical thinking and problem-solving skills. The curriculum allows for personalized learning and exploration as well as collaborative learning and teamwork. Join this session for a hands-on exploration of C-STEM Math with Robotics curriculum for Grades K-12, including 20 UCOP A-G Approved C-STEM courses.

Attendees must bring their own personal computer. Windows and MacOSX users must pre-install Linkbot Labs software from https://barobo.com/download/. Chromebook users must pre-install the Linkbot IDE extension from https://barobo.com/download/. Requirements: Windows 10 or above, MacOSX 10.13 or above, Chromebook with Chrome OS v. 89 or above.

2A

M H B

Hands-on Experience for Engaging Students Learning Math with Coding and Robotics (continued)

How to Integrate the C-STEM Program with Coding and Robotics into Elementary School Math Education

2B

E A

Chairs:

Dr. Ramona Robinson Bishop, CO-Founder and Chief Executive Officer, Elite Public Schools
Stephen Callahan, Coordinator, Educational Technology, STEM Programs, San Joaquin County Office of Education

Presenters:

Kristy Lindsey, C-STEM Program Manager, UC Davis
Ruth Thompson, 4th Grade Teacher, Redlands Unified School District
Sandra Soto, 5th Grade Teacher, Travis Unified School District

Description:

The C-STEM Mathematics with Robotics curriculum has had proven success in increasing student engagement and learning at the elementary level. Hear how a panel of Elementary School teachers have incorporated C-STEM curriculum in their Elementary Math classes, and how it maps to the big ideas in the upcoming new state math framework. C-STEM supports early learners in building confidence and understanding of abstract math concepts through applied hands-on robotics and programming activities. By incorporating coding and robotics into early education, students gain valuable exposure to modern technologies, develop logic-based problem solving skills, and apply creativity throughout their learning. In addition, the curriculum provides opportunities for integration with English Language Arts subjects, and text-to-speech and language translation features provide support for ELL students. The RoboPlay Challenge Competition is a theme-based level playing field robotics competition for K-12 students. It is designed for students to showcase their real-world math problem solving skills in a competitive environment. Join this session to learn more about how the C-STEM Program can transform math education at the elementary level.

11

2C

E
M
H
A

C-STEM K-12 CS Curriculum, UCD/UCR CS Supplementary Teaching Credential Authorization Program, C-STEM Certification for Teaching Credential Programs at Universities for Pre-Service Teachers

Chairs:

Dr. Fred Uy, Director of Department of Educator Preparation & Public School Programs, California State University Office of the Chancellor.

Annette Webb, Associate Dean, Director of Education, Academic Affairs, UCR Extension

Presenters:

Marcey Winawer, Math and CS Teacher, Mountain View Los Altos Union High School District

Deepika Srivastava, STEAM & Innovation Coordinator, Redlands Unified School District

Joanne Chan, Coordinator, Educational Services, Hacienda La Puente Unified School District

Jesus Esquibel, MSTI Director, Assistant Director, Citizen Scientist Project, CSU Bakersfield

Description:

UC Davis C-STEM has over a decade of experience in providing professional development for K-12 teachers, including those without any prior coding experience, on computer science (CS) and integrating CS into STEAM education. UC Riverside Extension has been a leader in offering CTC-approved credential programs and educator professional development certificates. They have offered the Computer Science Supplementary Authorization Credential Program since 2018. In partnership with UC Riverside Extension, C-STEM Professional Development is now centered around the California Computer Science Supplementary Teaching Credential Authorization for educators across California. Join this session to learn about C-STEM K-12 CS curriculum, the sequence of courses being offered, how to earn the credential, and how school districts can assist teachers in doing so. Also learn from the panel how university Departments of Education can incorporate C-STEM coding and robotics into their teaching credential programs for pre-service teachers through the C-STEM Certification.

3A

E M H B

CS with Music, Art, Language Arts, Makerspaces: Full STEAM Ahead

Facilitator:

Jeff Hescox, Education Service Manager, UC Davis C-STEM Center

Description:

The RoboBlocky Integrated Learning Environment offers even more than its innovative robotics-based math and CS curriculum. The curriculum provides opportunities for young students to enhance their reading skills, helping to meet the state goal of all students reading at an appropriate level by Grade 3. Students can learn language arts and express their creativity in music, art, and makerspace activities. This session shows how the C-STEM program integrates *Art* into STE*A*M education by giving students the opportunity to explore their artistic and creative talents using music and visual media. See how C-STEM's curriculum and activity resources support the development of artistic talents through various channels including drawing, storytelling, playing and composing melodies, learning math with a piano, and image processing. Explore how quickly and easily reconfigurable and modular Linkbot systems can be assembled by easily snapping parts together to accomplish various tasks and solve challenges. With a robotics-based STEAM makerspace, students will discover new ways to solve problems by designing, building, and testing their own robotics systems.

Attendees must bring their own personal computer. Windows and MacOSX users must pre-install Linkbot Labs software from https://barobo.com/download/. Chromebook users must pre-install the Linkbot IDE extension from https://barobo.com/download/. Requirements: Windows 10 or above, MacOSX 10.13 or above, Chromebook with Chrome OS v. 89 or above.

Linkbots and accessories will be provided by the C-STEM Center.

3B

M
H
A

How to Integrate the C-STEM Program with Coding and Robotics into Secondary School Math Education

Chairs:

Sue Brothers, Assistant Superintendent, Educational Services, Travis Unified School District

Rupinder Jagpal, TOSA in charge of C-STEM implementation, Manteca USD

Presenters:

Michelle Center, Teacher, Redlands Unified School District

Cliff Hilken, CTE Teacher, Elk Grove Unified School District

Paul Sommerfield, Math Department Chair, Elk Grove Unified School District

Judith Tuddao, Math Teacher, Manteca High School, Manteca USD

Teresa Sicat, Math Teacher, Manteca High School, Manteca USD

Description:

The C-STEM Mathematics with Robotics curriculum, including 20 UCOP A-G Approved C-STEM courses, has had proven success in increasing student engagement and learning at the secondary level. Hear how a panel of Secondary School Math teachers have incorporated the C-STEM curriculum in their math classes, and how it maps to the big ideas in the upcoming new state math framework. The RoboPlay Challenge Competition is a theme-based level playing field robotics competition for K-12 students. It is designed for students to showcase their real-world math problem solving skills in a competitive environment. Join this session to learn more about how the C-STEM Program can transform math education at the secondary level.

3C

E M H A

Expanded Learning: Girls In Robotics Leadership (GIRL)/GIRL+ Camps, Ujima GIRL Project, Afterschool and Summer Robotics Camps for Accelerated Math Learning

Chairs:

Dr. Teresa Aldredge, Past President, Umoja Education Foundation

Marcella Grant, Ujima GIRL Program Manager, UC Davis C-STEM Center

Speakers:

Lilibeth Pinpin, Director, Innovative Programs and Student Success, Solano County Office of Education

Dr. Rosalyn Clark, Targeted Equity Program Specialist, Education Equity Department, Elk Grove USD

Dr. Honey T. Sacro Swem, Elementary Coordinator, Curriculum and Instruction, Fontana USD

Joanne Chan, Instructional Services Coordinator, Hacienda La Puente Unified School District

Description:

Learn how to promote diversity and inclusion through the C-STEM Expanded Learning Programs by taking advantage of the existing C-STEM computing resources and robotics infrastructure. The C-STEM *GIRL (Girls in Robotics Leadership)* summer camps are focused on motivating middle school girls through peer mentoring to teach computing and STEM concepts through a fun and exciting robotics-based curriculum that culminates with the creation of a RoboPlay Video. GIRL+ camps are for high school students. The NSF-funded $2.4M *Ujima (Collective Work and Responsibility) Girls in a Robotics Leadership (GIRL) Project* aims to address the significant challenges of inclusion and equity for Black/African American middle school and high school girls in STEM education. More than 2,000 Black girls will be nurtured through this project to lead in science, technology, engineering and mathematics (STEM) in their schools, communities and careers. More than 10 new school district Ujima GIRL sites will be added in 2022-2023. *C-STEM Afterschool and Summer Robotics Camps for Accelerated Math Learning* are designed for schools and districts to host for their students locally. The camps focus on the cognitive and socio-emotional aspects of learning, alleviate some of the distress caused by the pandemic, and bring fun back to learning. They empower K-12 students for accelerated and deeper math learning through robotics projects and the solution of real-world problems using math concepts, and at the same time provide students with recreational and teamwork opportunities with peer-mentoring. Join this session to learn how to bring these C-STEM Expanded Learning Programs to your schools, districts, and communities.

C-STEM Teachers of the Year

In special recognition of their exceptional contributions to integrated computing and STEM education with the UC Davis C-STEM Program, and inspiring students to pursue careers and post-secondary study in C-STEM fields.

Greg Bradshaw

Michelle Center

Linda Dewberry

Cory Elgin

Monica Reyes

Teresa Sicat

Ruth Thompson

Lauri Truong

Judith Tuddao

Heather Williams

16

C-STEM Superintendent of the Year

In special recognition of his excellence in leadership in the implementation of the UC Davis C-STEM program on a districtwide scale in elementary, middle, and high schools.

Alfonso Jiménez

Awards

C-STEM Administrators of the Year

In special recognition of their strong leadership in supporting integrated computing and STEM education through systematic implementation of the UC Davis C-STEM program school, district, and/or county wide.

Jennie Dyerly

Monica Makiewicz

Monica Murray

David Nieto

New C-STEM Professional Development Starting Summer 2022!

Professional Development from the Joint UC Davis and UC Riverside Computer Science Supplementary Teaching Credential Authorization Program

http://c-stem.ucdavis.edu/cs

C-STEM is a UC Approved Educational Preparation Program for undergraduate admission to all UC campuses. UC Davis C-STEM has over a decade of experience in providing professional development for K-12 teachers, including those without any prior coding experience, on computer science (CS) and integrating CS into STEAM education. UC Riverside Extension has been a leader in offering CTC-approved credential programs and educator professional development certificates. They have offered the Computer Science Supplementary Authorization Credential Program since 2018. Starting Summer 2022 in partnership with UC Riverside Extension, C-STEM Professional Development has been centered around the California Computer Science Supplementary Teaching Credential Authorization.

The following sequence of professional development courses in the Computer Science Supplementary Teaching Credential Authorization Program will meet the California Commission on Teacher Credentialing (CTC) requirements. They will prepare K-12 teachers to teach a comprehensive computer science curriculum.

- **Introduction to Teaching Computer Science**
- **Programming and Integration of CS into STEAM Teaching**
- **Development of Integrated CS and STEAM Curriculum with Physical Computing**
- **Computer Programming in C**
- **Data Structures and Software Design**

Complete four courses to earn an Introductory Authorization and teach in grades 9 and below, or add the fifth course to earn a Specific Authorization to teach up through grade 12. Teachers will be able to teach CS classes or integrate CS and data science into their existing classroom teaching with computational thinking, computing practice and programming, impacts of computing, physical computing, Arduino as a device for data collection and analysis with visualization, data structures and algorithms, software design, etc., aligned with Common Core State Standards (CCSS) Math, Next Generation Science Standards (NGSS), and English Language Arts and Literacy Standards. Taking the courses for the Computer Science Supplementary Teaching Credential Authorization credits is optional. Teachers can also opt to receive CEU units.

"Oh my gosh! I barely can contain myself....soooo fun!!! So challenging and so rewarding at the same time!!!"

— Jessica Fernandez, Math Teacher, Glen Edwards Middle School, California

"I really loved this training. In over 20 years of teaching I can't remember another one I enjoyed so much."

— Sandy Andersen, Math Teacher, La Sierra High School, California

"The trainers did an amazing job taking very divergent topics (programming, robotics, math) and making it all very accessible for me. It all came together."

— Glen Warren, McPherson Magnet, Orange Unified School District

"I learned that I love computer programming and if you can get me to love this than you must be doing something right! If I love it then it will be so much easier to inspire my students."

— Amber Rafferty at Cambridge Elementary
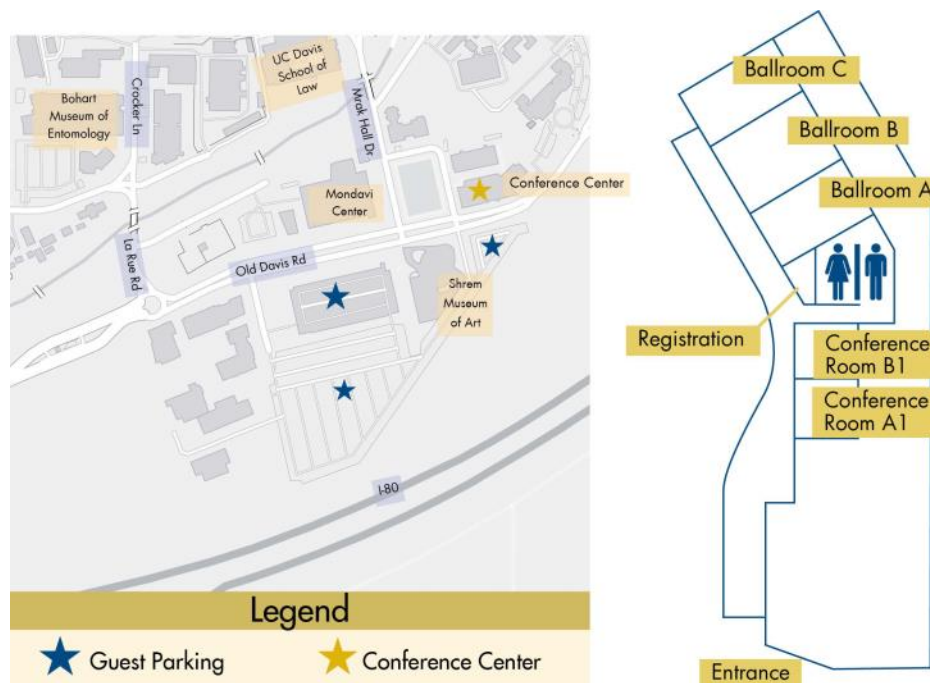
Information and Notes

Conference Location:

UC Davis Conference Center
540 Alumni Ln, Davis, CA 95616

WiFi Instructions:

1.Connect to ucd-guest (registration page will open)
2. Register a temp ucd-guest account
3. Log in with credentials that are texted or emailed to you
4. Twitter for troubleshooting: @ucdcstem

Link to download software to control hardware Linkbots and Arduino: www.roboblocky.com/download

Notes:

BECKMAN
COULTER

DEPARTMENT OF EDUCATION
STATE OF CALIFORNIA

NSF National Science Foundation

Barobo

SoftIntegration®