

UC Davis Center for Integrated Computing And STEM Education (C-STEM)

Transforming Math Education Through Computing

## **About C-STEM**

C-STEM is a UC Approved Educational Preparation Program for Undergraduate Admission for all UC campuses. C-STEM is UC A-G Program Status. Schools can easily add the A-G approved rigorous C-STEM curriculum to their own school's A-G course lists to satisfy the UC/CSU admission requirements. The mission of the C-STEM Center is to improve computing, science, technology, engineering, and mathematics in both formal and informal K-14 education. The C-STEM Math-ICT curriculum provides K-12 students with 12-years of computer science education through integrated learning of math and science with coding in Blockly and Ch/C/C++.

### **C-STEM PROGRAM**

#### Professional Development

- 1-Day Workshop
- 2-Day Academy
- 1-Week Institute
- Onsite Training
- Train-the-Trainer Program
- C-STEM Conference
- Educator Awards and Recognition

#### Support for Implementation

- Regular Classroom
- · Afterschool Program
- Community of Practice
- Support website, email, etc.
- Assessment and Evaluation

#### Curriculum Development

- Mathematics-ICT
- Computer Science
- Robotics
- Engineering

C-STEM Program

#### C-STEM Day and Competition

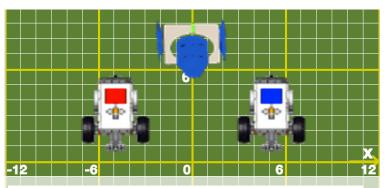
- RoboPlay Challenge Competition
- · RoboPlay Video Competition
- Student Awards and Recognition

#### **Technology Development**

- Computing Technology
- Robotics Technology

#### Informal Education

- GIRL Camps
- Youth Summer Camps



# RoboBlockly

A web-based robot simulation environment for learning coding and math. Based on Google Blockly, it uses a simple puzzle-piece interface to program virtual Linkbot and Lego Mindstorms NXT/EV3 for beginners to learn robotics, computing, science, technology, engineering, and math (C-STEM). Blocks can be executed in debug mode step-by-step.

C-STEM Studio is a user-friendly platform for using the C-STEM integrated curriculum by university faculty and students, K-12 teachers and students, parents, volunteers, etc. It is integrated with the breakthrough educational computing and robotics technologies for learning STEM subjects, including: C/C++, interpreter Ch, Linkbot Labs, Ch Linkbot Controller, Ch Mindstorms Package and Robot Controller for Lego, Mindstorms NXT/EV3, RoboSim, RoboBlockly, and Arduino.

#### C-STEMStudio

C for Science, Technology, Engineering, and Mathematics (STEM) education

- Programming with Ch
- Ch Command Shell Linkbot Labs
- CLC Ch Linkbot Controller
- ch Robot Controller
- RS RoboSim
- RB RoboBlockly
- Arduino

Code in Curriculum Teaching Resources Student Homework



C-STEM Studio is a platform for teaching science, technology, engineering, and mathematics (STEM) through computing and robotics for integrated

- the most engaging way to learn math, coding, and robotics,
   the simplest approach to program a robot,
- the easiest technology to control multiple robots.

## **C-STEMbian**<sup>™</sup>

C-STEMbian is a **free** open source Linux operating system based on Raspbian for Raspberry Pi. It extends Raspbian with easy installation of many additional components, including C-STEM Studio and user-friendly C/C++ interpreter Ch, to help absolute beginners learn coding, making, robotics, and STEM.



# **Empower STEM Teachers**



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

– Jessica Fernandez

Math Teacher at Glen Edwards Middle School

## **A C-STEM Success Story**

implemented 1 session C-STEM Integrated Math 2

A pass rate of 94% using a school wide standard math examination, the school average passing rate for other non C-STEM courses is 61%.













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**C-STEM Center** 

c-stem.ucdavis.edu