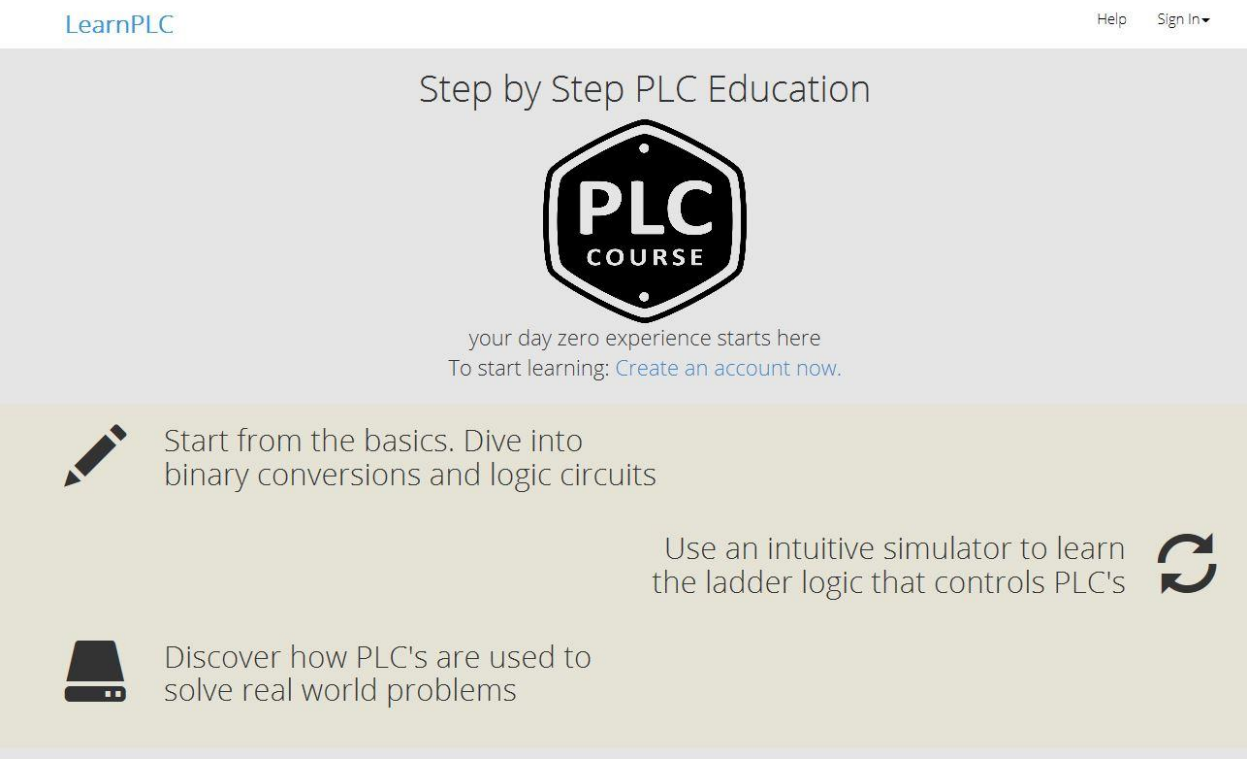
The LearnPLC web application can be accessed at its “Splash Page” link:

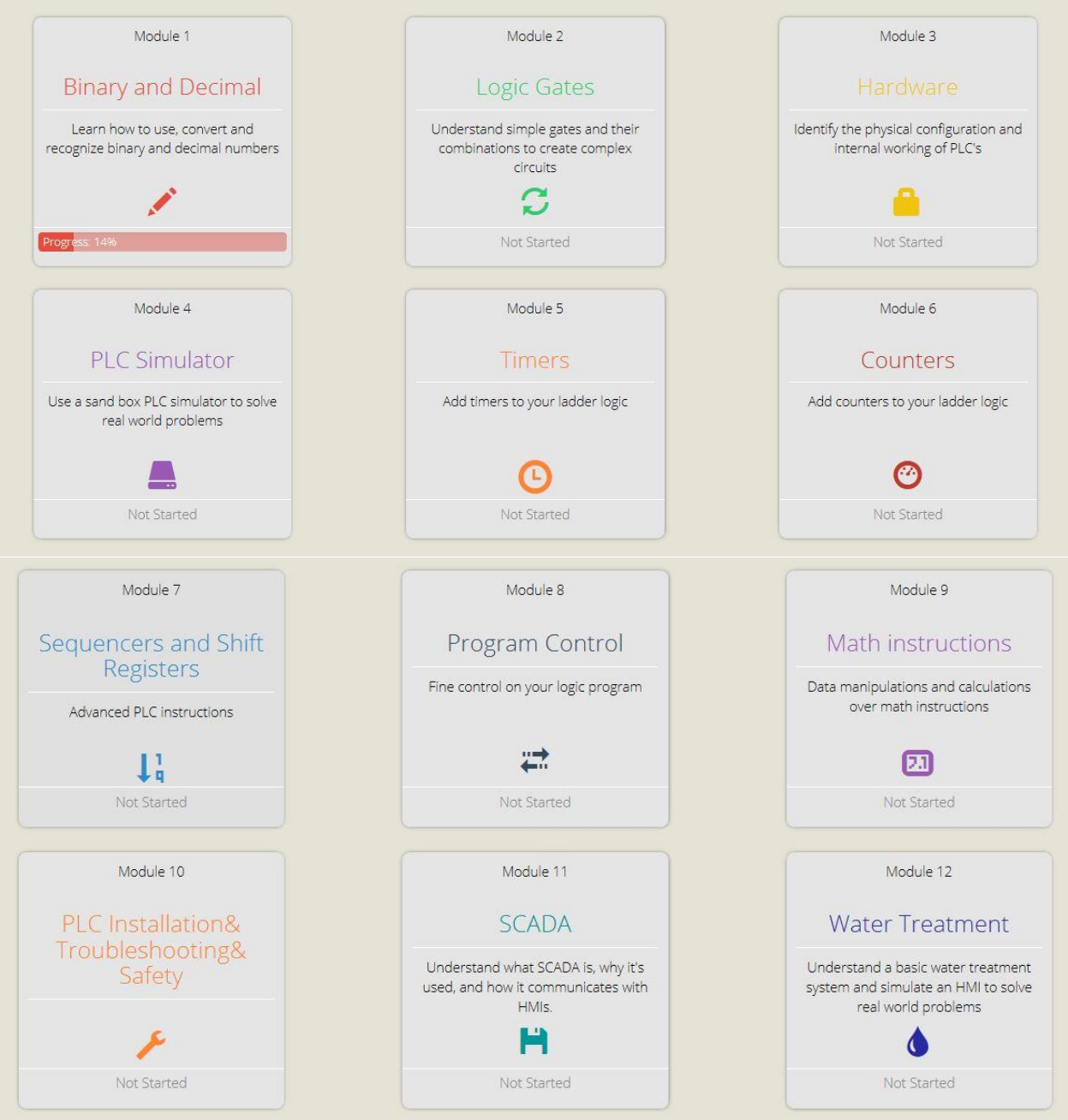
https://plc.csl.mtu.edu



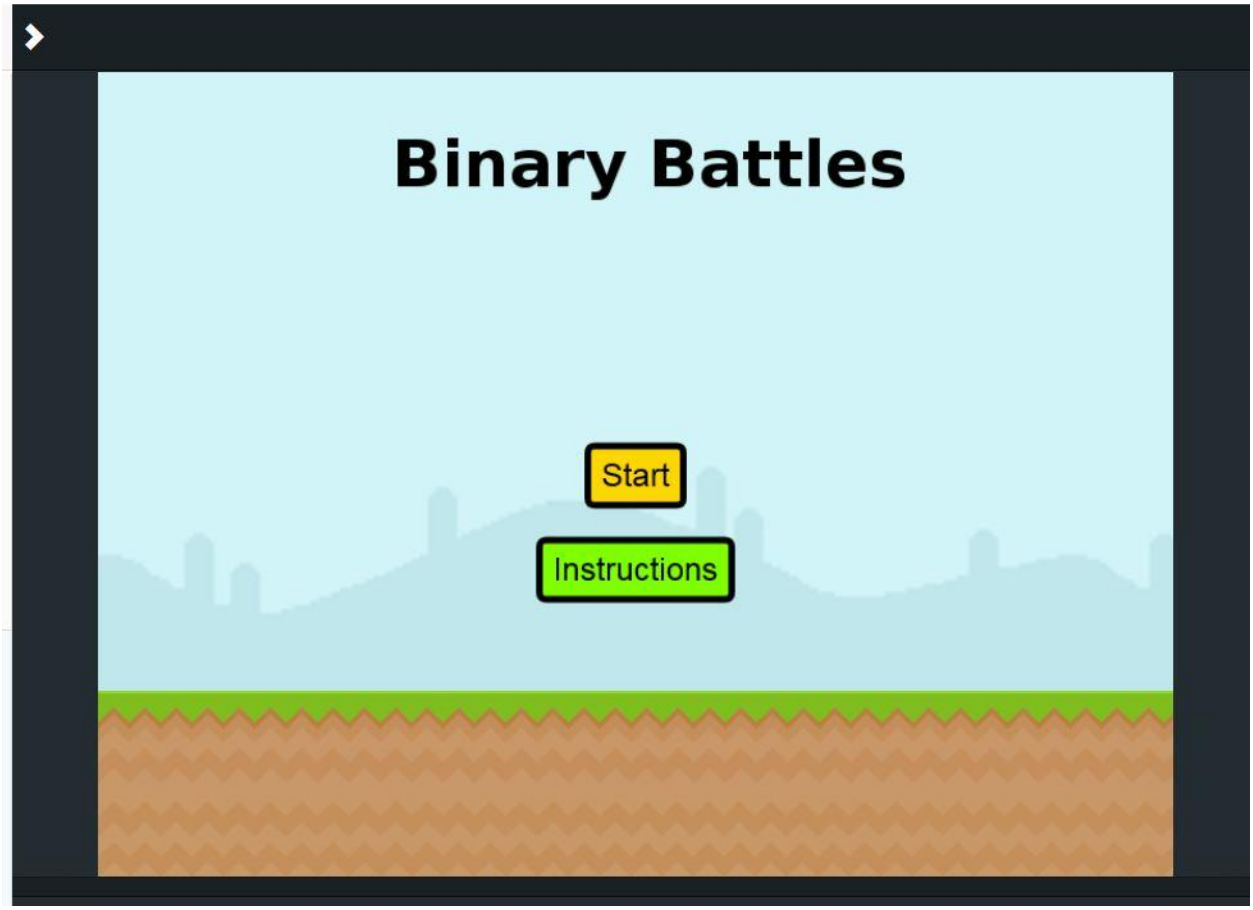
or directly at its Login page link:

https://plc.csl.mtu.edu/account/login

The open source Creative Commons license web application is live and functional for all 12 modules and the application is available for public use – to ANYONE in the world with a computer and an Internet connection. New accounts can be created at the links above and do require email verification at any email address. Multiple individual accounts are allowed.



The web application is intended as a resource for instruction or support for instruction for learning the fundamental concepts and specific skills for programming *Programmable Logic Controllers* (PLC's), the control mechanism for many industrial processes including in the area of advanced manufacturing. The concepts taught are generic and independent of specific hardware or software so that they can be applied across a wide range of fields but with an emphasis on those skills relevant to Advanced Manufacturing. Metaphors such as home automation or water treatment are used to make skills application concrete and visible and "gamification" (the use of games to teach) is used as a fun and motivational tool to encourage mastery of the concepts and skills involved.

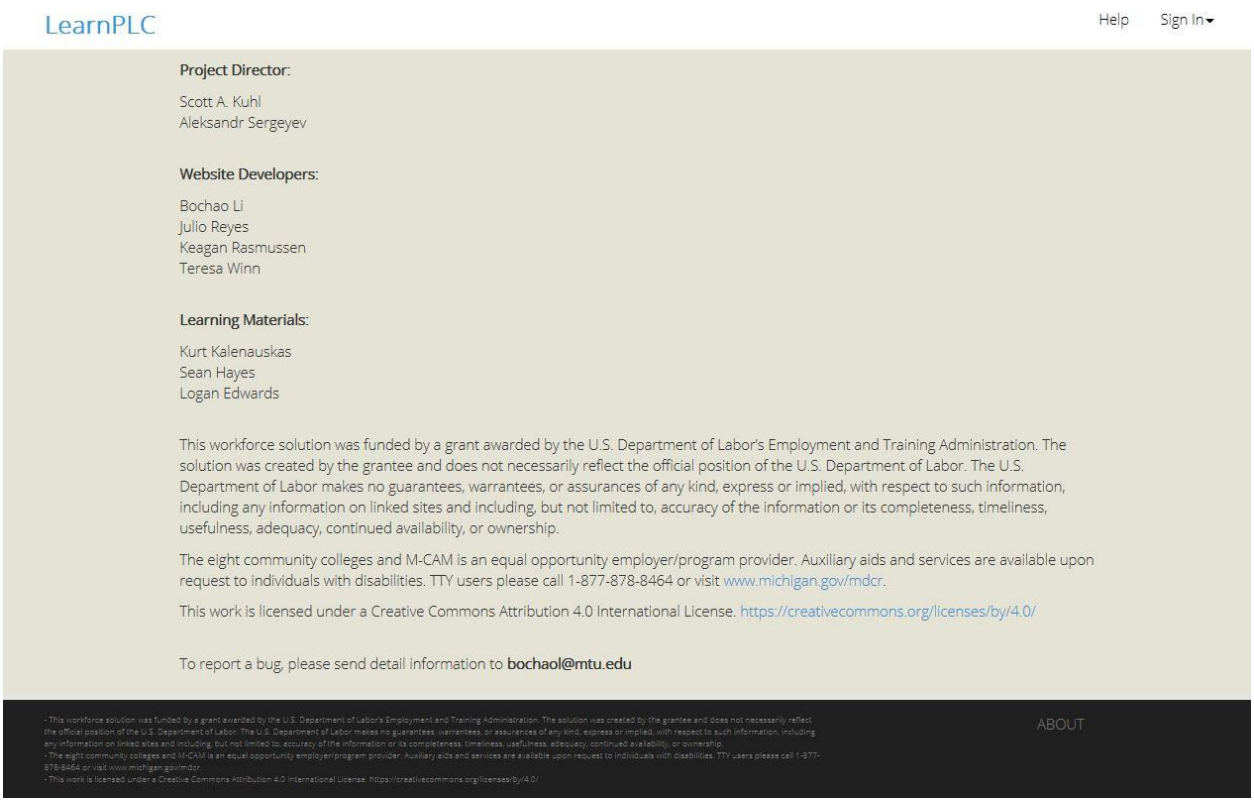


At Bay College we have primarily used LearnPLC as a supplemental resource for our (M-CAM) Mechatronics Certificate and Mechatronics and Robotics Systems associate's degree students. Students can either use LearnPLC independently for support on key topics they might be having trouble with or can be assigned particular modules that are tracked by the instructor using the Instructor login. The instructor login allows an instructor to assign specific modules to students and keep track of their progress and the results of inline assessments. Instructors should note that they may create multiple accounts as long as each is linked to a unique email address. This is useful if an instructor would like to have both a "student" and "instructor" account. The software has not been used at Bay as much for "let's get up and go to the computer lab" use during class time, but this is also a possibility if it fits well with the instructional practice of a particular faculty person.

On February 12, 2017 Bay College M-CAM Lead Robert Pontius, Project Manager Beth Ann Belcher, and Mechatronics instructor Mark Highum led an overview demonstration of the software, including a hands-on workshop experience with the LearnPLC software (using laptops provided by Lansing Community College) for those attending the Strategy and Operations meeting in Lansing. Mark Highum described M-CAM program student usage of the LearnPLC software and also demonstrated the "Instructor" account functionality.

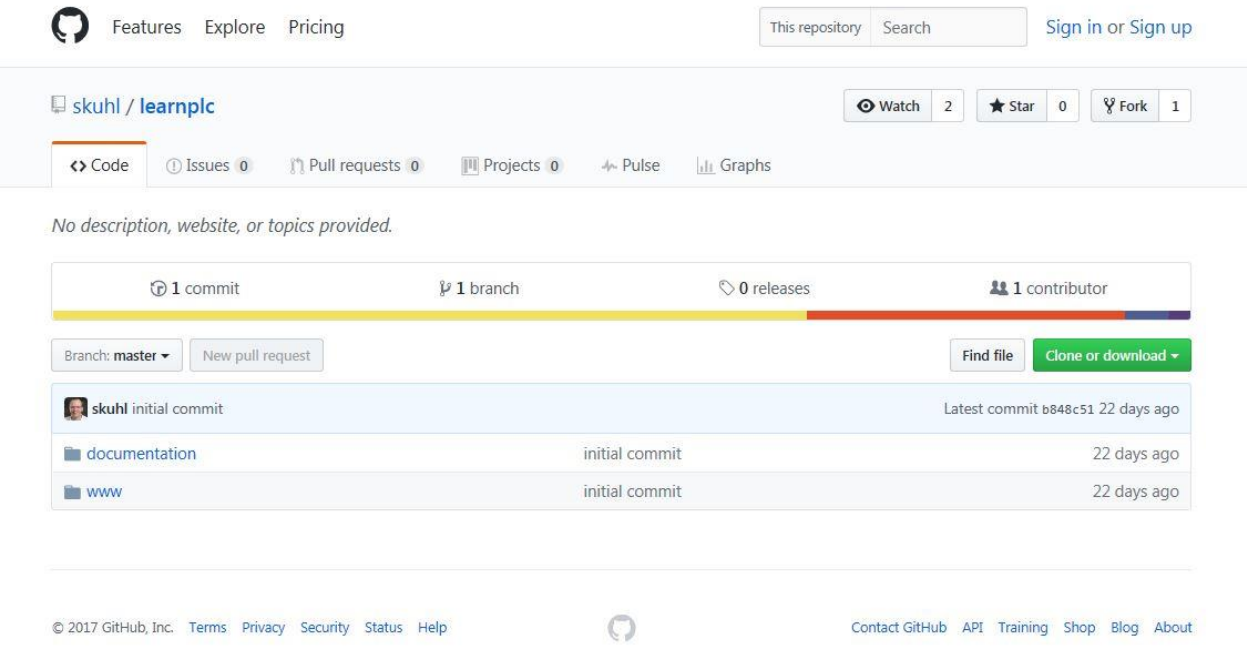
LearnPLC has been available to anyone in the world without permission or college affiliation going back at least a year and was available for replication via "view HTML" source code. In November 2015 Bay College and Michigan Tech staff delivered a software presentation/demonstration with the Leads and Project Managers. However, until recently MTU hadn't yet released the source code as a "package" nor completed local install instructions.

The application is completely open source and licensed under ***Creative Commons Attribution 4.0 International License***, as indicated (along with DOL, M-CAM attribution and disclaimers) in the application footer as well as the "About" page: https://plc.csl.mtu.edu/about



The source code, documentation, and installation instructions for the web application is available here:

https://github.com/skuhl/learnplc



There is also a documentation folder at the github link with information intended to help those who wish to learn something about how the code works and/or to create a copy of the website for themselves. The documents may not be useful for those who lack the experience/expertise web application development. A link from the "about" page on the LearnPLC to the github page source code and other resources will be added shortly.

Google Analytics has been added on the back end of the LearnPLC web application to track usage and unique visit statistics and data.

Contacts:

Robert Pontius is LearnPLC project lead for Bay College with assistance from Project Manager Beth Ann Belcher.

Mark Highum is the Bay College Instructor/Coordinator for Mechatronics and Robotics Systems. His email is: highumm@baycollege.edu and phone is: 906.217.4083

Scott Kuhl Scott Kuhl (kuhl@mtu.edu) is the Michigan Tech Associate Professor, Computer Science, Adjunct Associate Professor, Cognitive & Learning Sciences, and Faculty advisor, Husky Game Development Enterprise. Scott, along with Professor Aleksandr Sergeyev, are the Project

Directors for the web application at Michigan Technological University. Other development information is provided at the “About” page: https://plc.csl.mtu.edu/about

Technical assistance or bug reporting email contact is: bochaol@mtu.edu