

Saturday Workshops

JavaScript Applications for CS0/CS1: Getting Hands-on with Code.org's App Lab

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App Lab (<https://code.org/applab>) is Code.org's rapid-prototyping environment for creating HTML, CSS, and JavaScript-powered web applications. It was created as part of a rich set of instructional resources designed for teachers of the new AP Computer Science Principles (CSP) course. Yet, App Lab far exceeds the needs of CSP, and would be an appropriate learning environment for students in any CS0/CS1 class, even at the university level. App Lab gives novice programmers access to capabilities previously reserved for courses that require sophisticated tech setup and knowledge of both front and backend web development, server-side scripting, databases, etc.

Rather than focusing on curriculum, this workshop will focus on how App Lab works as a programming tool in its own right, and how it was designed to aid and motivate student learning. Participants will get hands-on time with some of App Lab's more advanced features guided by a Code.org product manager, while working with the education team to help understand the educational philosophy that went into its development. Participants will come away with exemplars that highlight App Lab's possibilities, practice with some of its richer features, and do a hackathon to create something to share with each other (and the world)! Finally, we will end with a discussion about how best to integrate App Lab into existing courses.

App Lab was developed as part of collaboration between Code.org and David Bau (Google), creator of PencilCode.net.

A laptop is required for this session. All other materials will be provided.

Keywords: App Lab; Code.org; JavaScript; CS0; CS1; Programming Environment; Web Development

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Programming Web Services on the Cloud with Node.js

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Web services (a.k.a. web APIs) allow developers to build web and mobile applications using data from multiple online sources. This workshop is aimed at CS instructors that wish to teach how to use

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and write web services using Node.js on a cloud development environment. Node.js is an open source JavaScript platform that is currently used by companies like PayPal, DowJones, Walmart, Netflix, and Yahoo. Over 120 companies in the fortune 500 are not only using, but embracing Node.js in their everyday operations. Using and writing web services in Node.js is significantly easier than using other environments based on languages such as C# or Java. Because we will be using a cloud platform, all our tools are readily available through any modern web browser, thus eliminating the hassle related to installing a complete standalone development environment. Teaching web API design with Node.js on the cloud provides our students a relevant real life technical skill. Workshop participants will use the free service provided by Cloud9 IDE (<https://c9.io/>) to learn how to write scalable RESTful web services using Node.js, the Express web framework, MySQL, and jQuery. Participants should have a working knowledge of HTML, JavaScript, and SQL. Additional information available at: <http://node.arielortiz.info/> **Laptop required.**

Keywords: Web development; Web services; JavaScript; Node.js

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Teaching Robotics Using ROS

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The deployment of autonomous and semi-autonomous robots is likely to increase dramatically over the next decade. Recent autonomous vehicle prototypes illustrate both the rapid progress of the underlying technology and the commercial possibilities of robotics. The next few years are likely to see increased interest in robotics among both students and employers.

The Robot Operating System (ROS) is an open-source software framework for developing robotics applications. It has become a standard platform with a wide range of supported robots and a vibrant software ecosystem.

This workshop will provide a hands-on introduction to ROS. Participants will have the opportunity to write ROS-based Python programs to control a Turtlebot educational robot. We will discuss the benefits and challenges of using ROS in an undergraduate robotics course. The workshop is intended for CS educators with an interest in teaching robotics. Laptops will be provided. No experience with ROS or Python is required.

Keywords: Robotics; ROS

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