Saturday Workshops

Using and Customizing Open-Source Runestone Ebooks for Computer Science Classes

Barbara Ericson, Jaclyn Cohen, *University of Michigan*
Brad Miller, *Runestone Interactive, LLC*
Contact: barbarer@umich.edu

Runestone Interactive is an open-source ebook platform designed to create and publish interactive computer science textbooks. (See http://runestoneinteractive.org). Runestone ebooks support programming in the browser, code visualizations, and a wide variety of practice activities, from multiple choice and fill-in-the-blank questions to Parsons Problems (drag-and-drop mixed-up code). Free textbooks have been created for CS1, CS2, and Advanced Placement (AP) CS. The presenters have several years of experience creating and using Runestone ebooks. Several studies have demonstrated good usability and positive learning and attitude impacts on students using these ebooks. Runestone ebooks can be customizable to meet the needs of individual courses and teachers. Over 20,000 people a day use Runestone ebooks.

The goal of this workshop is to introduce computer science teachers (both secondary and post-secondary) to Runestone ebooks. This hands-on session will start by leading participants through use of the ebooks as if they were students. Participants will try each of the interactive features. They will also create a custom course from an existing ebook, use the instructor dashboard to review student activity, modify the course, and grade students. Participants will create their own assignments using existing active learning components. They will also be shown how to create new material for assignments, such as multiple-choice questions for a quiz. ***Laptop Required.***

Keywords: ebooks; electronic books; Parsons problems; Parson's problems; active learning

DOI: https://doi.org/10.1145/3287324.3287545

To Dissemination... And Beyond! Building Better Propagation Plans for Computer Science Education Innovations

Christopher Lynnly Hovey,
University of Colorado Boulder
Cynthia Taylor, *Oberlin College*
Heather Bort, *Marquette University*
David P. Bunde, *Knox College*
Zack Butler, *Rochester Institute of Technology*
Contact: hoveyc@colorado.edu

In computer science, educational innovation is constant, but many great ideas never achieve the type of widespread adoption necessary to make lasting and effective change to the way we teach and learn. Research across STEM education has shown that propagation planning is often an overlooked or undervalued part of educational innovation. Whether promoting our own projects or an outside innovation, barriers to success are more difficult to overcome when encountered without sufficient preparation. Plans for adoption and scaling of innovations are not one-size-fits-all, but there are lessons we can learn from both successful and unsuccessful previous projects. We will present a summary of these lessons based on our recent ITiCSE working group research experience on the topic. This writing workshop will focus on building propagation plans informed by best practices, within the context of individual project definitions of success. We will work in small groups to identify potential barriers to the success of our projects, learn about best practices for overcoming those barriers, and put in place a measurable and actionable plan for adoption and propagation. Participants will work toward a better plan for propagation while garnering advice from their peers, learning and generating new ideas about and methods for dissemination and adoption, and building a community of resources for future collaboration, champions for change, and peer feedback. Bringing a laptop is recommended.

Keywords: increasing use; faculty adoption; educational innovations; propagation

DOI: https://doi.org/10.1145/3287324.3287550

Architecting Serverless Microservices on the Cloud with AWS

Ariel Ortiz, *Tecnologico de Monterrey,*
Campus Estado de México
Contact: ariel.ortiz@itesm.mx

A microservice architecture decomposes the entire functionally of an application into a set of services that can be deployed and scaled independently. Each service does only one job and does it well. Thus, it's simpler to develop, test and maintain. Additionally, it has its own database and provides access to datasets and services through a well-defined application programming interface (API). Highly successful Internet companies, such as Amazon, Netflix, and Twitter, use microservice architectures to build their software. This workshop is aimed at CS instructors that wish to teach students how to design and build microservice-based applications using cloud services and products provided by the Amazon Web Services (AWS) free tier. We'll start creating a cloud development environment with the AWS Cloud9 IDE. Afterwards, we'll code in Python several RESTful web services using AWS Lambda functions, which are serverless cloud computing services that are executed in response to events. The advantage of going serverless is that you build and run applications and services without thinking about servers. Your application still runs on servers, but all the server management is done by AWS. Finally, we'll demonstrate how to persist our information in a NoSQL database using the Amazon DynamoDB service. More information available at: *http://microservices.arielortiz.info/* **Laptop required.**

Keywords: Microservices; Serverless Computing; Cloud Computing; RESTful API

DOI: https://doi.org/10.1145/3287324.3287533

SIGCSE '19, February 27-March 2, 2019, Minneapolis, MN, USA
© 2019 Copyright is held by the owner/author(s).
ACM ISBN 978-1-4503-5890-3/19/02.