

Bringing Real-World Data And Visualizations Into Data Structures Courses Using BRIDGES

Presenters

Kalpathi Subramanian; Department of Computer Science; University of North Carolina at Charlotte; 9201 University City Blvd.; Charlotte, NC 28223 USA; Phone: +704-687-8579; Email:krs@uncc.edu

Jamie Payton; Department of Computer Science; University of North Carolina at Charlotte; 9201 University City Blvd.; Charlotte, NC 28223 USA Phone: +704-687-8188; Email: payton@uncc.edu

Contact Person

Kalpathi Subramanian(contact information above)

Abstract.

This demo introduces participants to the concepts and application of BRIDGES, a software infrastructure designed to facilitate hands-on experience for solving traditional problems in introductory computer science courses using data from real-world systems that are of interest to students, such as Facebook, Twitter, and Google Maps. BRIDGES provides access to real-world data sets for use in traditional data structures programming assignments, without requiring students to work with complex and varied APIs to acquire such data. BRIDGES also helps the students to explore and understand the use of data structures by providing each student with a visualization of operations performed on the student's own implementation of a data structure. BRIDGES visualizations can be easily shared (via a weblink) with peers, friends, and family. Workshop attendees will engage in hands-on experience with BRIDGES and will have the opportunity to discuss how BRIDGES can be used to support various introductory computer science courses.

Intended Audience

CS educators teaching algorithms or data structures courses who are interested in using real-world datasets and visualizations in course assignments; students embarking on a teaching career; developers who might be interested in implementing extensions to apply BRIDGES for other core courses in CS, extend BRIDGES to new data sources.

Expertise of Presenters:

Kalpathi Subramanian is an Associate Professor of Computer Science at the University of North Carolina at Charlotte. He has been a faculty member since 1993 and teaches a range of computer

science courses. He has significant experience in working with CS undergraduate students via senior research that have resulted in numerous publications. He is the PI on a recent NSF TUES award, *Building BRIDGES Within the Undergraduate Major in Computer Science*, along with Drs. Jamie Payton, Michael Youngblood and Robert Kosara, which is the motivation for this workshop. He received his PhD from the University of Texas at Austin, in 1990.

Jamie Payton is an Associate Professor of Computer Science at UNC Charlotte. She is the PI of the STARS Computing Corps, an NSF-funded alliance of 50 colleges and universities that aims to broaden participation of underrepresented groups in computing. She is the creator of the Mobile Application Development for Science program, which leverages her research in crowdsensing (i.e., engaging the general public in collecting data using sensors embedded on mobile phones for a civic or scientific purpose) to introduce middle school students to STEM concepts. She is a co-PI on the NSF-funded project, The Connected Learner, which aims to revolutionize CS education by connecting students to their peers, the profession, and a purpose, and is a co-PI on the BRIDGES project.

Materials Provided

Attendees will be provided a handout that provides an overview of BRIDGES with links to more detailed documentation, tutorials. The software will be accessible for attendees who might want to experiment with BRIDGES and run the examples during the session to give them a 'hands-on' experience.

Audio/Visual and Computer Requirements

1. Wireless/ethernet access and power socket required (we will need to be able to connect to the internet)
2. If available, a projector would be helpful to display BRIDGES visualizations.