

Fostering Creative and Collaborative Co-curricular Activities

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Abstract

Agile and DevOps processes are generally considered beneficial to collaboratively producing high-quality software. Thus, employers currently seek people with skills in these areas, even for entry-level positions which new Computer Science (CS) graduates often fill. However, undergraduate CS programs generally only provide opportunities for students to practice concepts in simple classroom projects, instead of providing immersive experiences. Industry internships do expose students to real-life development and maintenance (emphasis on maintenance), but interns often report that they did not experience the entire product life cycle, and many say the “big picture” was not apparent.

In this talk, we share our experience from *three co-curricular initiatives* where students learn *practical* aspects of *collaboratively building* high-quality *production software* alongside faculty members using many of the same tools and processes the industry uses. Importantly, the process of learning and practicing is itself agile-like, in the sense that students incrementally gain concepts and learn hands-on why certain approaches and alternatives may be necessary.

The initiatives include *two hands-on labs* named Data Science & Systems Lab (DASSL, read *dazzle*) and Special Interest Group on C++ (SIGCPP), and a Microsoft Teams organization named SMOPEN. All initiatives were started by *one faculty member* and have thus far engaged nearly 40 *CS undergraduate students* across academic levels. The faculty member generally moderates discussions and introduces new concepts, but code reviews and other “quality processes” apply equally to all members. The initiatives are *not part of any coursework* and *participation is voluntary*.

Collectively, the initiatives have yielded three free and open-source software (FOSS) products, a detailed product documentation, four peer-reviewed papers, four conference presentations, two panel participations, a blog, and a Twitter account (@sigcpp). Much of the work product is in GitHub repositories, with many repositories being public. One of the products—*ClassDB*—has been used by over 100 students to learn data management and is free for use by anyone teaching data management and software engineering. ClassDB and other outcomes from the initiatives have also been included as case studies in programming, software engineering, and data-management courses.

Through this talk we hope to popularize creative and collaborative co-curricular initiatives in academic environments, share our experience and learn from others’ experiences, and where possible expand our own network by adding like-minded faculty and student collaborators from other institutions of learning.

Biography

Dr. Sean Murthy is a Principal Researcher at The Else Institute. He is also the founder and director of DASSL, and the founder and moderator of SIGCPP and SMOPEN. Until recently, he was an Associate Professor of Computer Science at the Western Connecticut State University, and prior to that the General Manager of Applied Research at Wipro Technologies. He has extensive experience in software engineering, distributed systems, and data management, and has developed several commercial software products including a few for Fortune 100 companies. He has also founded and successfully exited technology startups.

Dr. Murthy has a PhD in CS from Portland State University and a Masters in CS (Data-intensive Systems) from Oregon Health & Science University. He is a Senior Member of the Association for Computing Machinery (ACM). He is also a member of the Institute of Electrical and Electronics Engineers (IEEE), IEEE Computer Society, and IEEE committee on Software Engineering Body of Knowledge 4.0 (SWEBOK).

Dr. Murthy has been an invited speaker at influential organizations such as the British Royal Society, IBM Research, and Microsoft. His publications and other scholarly work are listed on his personal web site and are included in popular digital libraries. Some of his work and thoughts are also published on GitHub, the SIGCPP blog, and Twitter.