Anshul Shah

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Education

University of California, San Diego — La Jolla, CA
PhD in Computer Science — *Sept. 2021 – current*

Duke University — Durham, NC
Bachelor of Science in Computer Science and Statistics — *Aug. 2017 – May 2021*

Research Experience

Program Comprehension in Large Code Bases — March 2023 – Present
UC San Diego — *La Jolla, CA*

- Program comprehension is the most time-consuming process of a developer's workflow and impacts code quality, code explanations, and developer productivity. However, research is limited with regards to a) students' struggles to comprehend large code bases and b) skills students need to be able to contribute to a large, existing code base. This work aims to identify specific student struggles and develop a research-based curriculum to address students' struggles in comprehending a large code base.

Live Coding in Introductory Programming — June 2020 – Present
UC San Diego — *La Jolla, CA*

- Live coding is a recommended teaching practice, but we have little empirical research on its impact on students' programming processes. This work uses fine-grain data of students' programming sessions to measure students' adherence to incremental development, debugging, and testing practices.

Supporting Metacognition with CompassX — Sep. 2019 – Present
UC San Diego, Duke University — *La Jolla, CA & Durham, NC*

- Beyond conceptual knowledge and programming skill, a key goal of courses is to teach students *metacognitive skills*, such as planning, self-monitoring, self-evaluation, and reflection. I developed a web application called CompassX that has been administered in courses at Duke University and UC San Diego to hundreds of students. The goal of CompassX is to provide students with an opportunity to review CS content while interleaving metacognitive activities during students' study sessions.

Teaching Experience

CSE11: Accelerated Intro to Programming | *UC San Diego* — Fall 2023
- 100% Recommendation Rate (47 responses)

CSE190: Working with Large Code Bases | *UC San Diego* — Spring 2023
- 100% Recommendation Rate (9 responses)

CSE8A: Intro to Programming in Python | *UC San Diego* — Fall 2022
- 100% Recommendation Rate (27 responses)

Data Science with Pandas | *AI4ALL* — Summer 2022

CS216: Everything Data | *Duke University* — Spring 2021

CS101: Introduction to Computer Science | *Duke University* — Fall 2018 – Spring 2021
- I served as a teaching assistant for 6 semesters for this course.

Awards

Denardis Memorial Award | *Duke University* — Spring 2021
- One of two students to receive this award from the Duke CS Department for outstanding service to the department, specifically in developing the CS101 Reviewer App (now CompassX) and 3 years as a teaching assistant

Service

Reviewer, ITiCSE 2024 Computing Education Research Papers
Reviewer, ITiCSE 2024 Experience Reports
Reviewer, SIGCSE TS 2024 Experience Reports

Mentoring

Undergraduate Students

Luis Millan (ERSP)
Brandon Ngeihm (ERSP)
Kevin Wu (ERSP)
Gonzalo Allen-Perez (ERSP)
Fatimah Alhumrani
Vardhan Agarwal
John Driscoll
Michael Granado

Other Mentoring

CSE599 Mentor TA, Spring 2022

Funding

* Denotes that I led the ideation, writing, and execution of the grant

Course Development and Instructional Improvement Program ($50,000)* | *UC San Diego* Summer 2023
- Awarded for development of course materials and curriculum redesign of CSE190: Working with Large Code Bases

Textbooks

An Introduction to Working with Large Code Bases | *UC San Diego* Upcoming
- I am writing a textbook hosted on Stepik to accompany the "Working with Large Code Bases" course I designed and co-taught. The textbook will be available in the Spring 2024 quarter.

Publications

[1] **Anshul Shah** and Adalbert Gerald Soosai Raj. A Review of Cognitive Apprenticeship Methods in Computing Education Research. In *Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 1*, SIGCSE 2024, New York, NY, USA, 2024. Association for Computing Machinery.

[2] **Anshul Shah**, Jerry Yu, Thanh Tong, and Adalbert Gerald Soosai Raj. Working with Large Code Bases: A Cognitive Apprenticeship Approach to Teaching Software Engineering. In *Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 1*, SIGCSE 2024, New York, NY, USA, 2024. Association for Computing Machinery.

[3] **Anshul Shah**, Emma Hogan, Vardhan Agarwal, John Driscoll, Leo Porter, William G. Griswold, and Adalbert Gerald Soosai Raj. An Empirical Evaluation of Live Coding in CS1. In *Proceedings of the 2023 ACM Conference on International Computing Education Research - Volume 1*, ICER 2023, New York, NY, USA, 2023. Association for Computing Machinery.

[4] Mrinal Sharma, Hayden McTavish, Zimo Peng, **Anshul Shah**, Vardhan Agarwal, Caroline Sih, Emma Hogan, Ismael Villegas Molina, Adalbert Gerald Soosai Raj, and Kristen Vaccaro. Engagement and Anonymity in Online Computer Science Course Forums. In *Proceedings of the 2023 ACM Conference on International Computing Education Research - Volume 1*, ICER 2023, New York, NY, USA, 2023. Association for Computing Machinery.

[5] **Anshul Shah**. Improving Students' Programming Processes Using Cognitive Apprenticeship Methods. In *Proceedings of the 2023 ACM Conference on International Computing Education Research - Volume 2*, ICER 2023, New York, NY, USA, 2023. Association for Computing Machinery.

[6] **Anshul Shah**, Vardhan Agarwal, Michael Granado, John Driscoll, Emma Hogan, Leo Porter, William Griswold, and Adalbert Gerald Soosai Raj. The Impact of a Remote Live-Coding Pedagogy on Student Programming Processes, Grades, and Lecture Questions Asked. In *Proceedings of the 2023 Conference on Innovation and Technology in Computer Science Education V. 1*, ITiCSE 2023, New York, NY, USA, 2023. Association for Computing Machinery.

[7] **Anshul Shah**, Michael Granado, Mrinal Sharma, John Driscoll, Leo Porter, William G. Griswold, and Adalbert Gerald Soosai Raj. Understanding and Measuring Incremental Development in CS1. In *Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 1*, SIGCSE 2023, New York, NY, USA, 2023. Association for Computing Machinery.

[8] **Anshul Shah**, Jonathan Liu, Kristin Stephens-Martinez, and Susan H. Rodger. The CS1 Reviewer App: Choose Your Own Adventure or Choose for Me! In *Proceedings of the 26th ACM Conference on Innovation and Technology in Computer Science Education V. 1*, ITiCSE 2021, New York, NY, USA, 2021. Association for Computing Machinery.