A Workbook for Distinctive Computer Science Curricula:

Designing Programs Aligned with Liberal Arts Institutional and Departmental Identity

{Authors anonymized during SIGCSE Review}

Introduction

Curricular guidelines, such as the CS2023: ACM/IEEE-CS/AAAI Computer Science Curricula that is currently under development, can be a valuable resource for those creating and revising curricula. The guidelines are intended, however, to address computing curricula in computer science and closely aligned fields at a wide variety of institutions and can be overwhelming to consider. There is no "one size fits all" for computing curricula, given the variety of contexts in which computing programs operate. In particular, liberal arts curricula often leverage their unique institutional context and mission to create innovative programs. Indeed, it is not practical, and most likely not useful, to blindly consider a curricular guidelines document like CS2023 and decide to adopt or modify a program at a particular institution without a clear understanding of the program's opportunities and constraints. It is important to develop, or at least clarify, the institutional and departmental identity and goals, and view the curricular standards through that perspective.

With a focus on computing departments that operate within a liberal arts context or otherwise reflect a liberal arts perspective, this workbook is designed to help faculty work through their program's current and desired identity and goals to develop (or improve) a set of design principles and program level learning outcomes before turning to CS2023 to inform curricular re-design. Institutions that adopt a liberal arts perspective "pursue a philosophy of higher education that emphasizes preparing students for the full range of thinking they will face throughout their lives; thinking in the service of a career, thinking in order to participate in civic affairs and society generally, thinking in order to have a fulfilling personal life, etc."[1]. While the approach outlined in this workbook can be applied to all computing programs, it emphasizes priorities that tend to be most important in a liberal arts context. These include strong ties to an institutional mission, an emphasis on a broad educational experience, and the constraints imposed and opportunities provided that result in unique and innovative curricula that exist

[1] Douglas Baldwin, Amanda Holland-Minkley, and Grant Braught. 2019. Report of the SIGCSE committee on computing education in liberal arts colleges. ACM Inroads 10, 2 (June 2019), 22–29. https://doi.org/10.1145/3314027

within that context. Further motivation for this process and the research behind its design is available in a companion article by the authors.[2]

Overview of the Process

This workbook separates the process of curriculum design into six steps: