Integrating Society, Ethics and the Computing Profession With Computer Science Curricula 2023

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ABSTRACT

The interaction of computing and society, the requirement for ethical development and use of computing technology, and the responsibility our profession has to society, have never been greater. This poster provides an in-depth picture of how the "Society, Ethics, and The Profession" (SEP) knowledge area (KA) in the CS2023 curricular guidelines was designed, spanning the evolution of the KA, and how the CS2023 SEP KA was designed so that future CS graduates will have the SEP knowledge, skills, dispositions, and competencies to effectively and responsibly carry out their work as professional computer scientists. The ultimate goal is to help educators in integrating these new guidelines into their curricula.

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THE SEP KNOWLEDGE AREA

Social, ethical, and professional topics were included as a dedicated KA in CC1991[1], and in the three subsequent guidelines through CS2013[2]. CS2023 [2] saw the largest change to-date in terms of this KA: more than doubling the hours recommended by CS2013, adding a Diversity, Equity, Inclusion, and Accessibility (DEIA) knowledge unit (KU)[3]; adding flexible course packagings; and most significantly, embedding SEP topics across all KAs in CS2023.

THE CS2023 APPROACH TO SEP

The establishment of a dedicated SEP KA was a significant development. However, given the deepening influence of CS on society (and vice-versa) the importance of SEP has never been greater. For example, the current prominence of AI raises extremely important SEP topics. Nonetheless, obstacles such as integrating SEP topics into already full curricula have historically posed large challenges. Additionally, by their very nature SEP topics pervade all areas of CS in the real world. However, this is not reflected in the structure of prior guidelines where SEP was simply a dedicated KA. Unfortunately, that led to SEP topics not being taught widely, as prior curricula implied that a dedicated SEP course was the only way to deliver SEP topics, given the natural tendency to build courses from KAs. Additionally, dedicated SEP courses often lack the natural contexts in which SEP topics arise: e.g., it is likely that the SEP topics that arise within AI are best taught in AI courses.

To address these issues, the CS2023 steering committee agreed that in addition to the continuance of SEP as a KA, *all* other KAs would strive to include an SEP KU addressing SEP topics that naturally arise in those KAs. In the end, 12 KAs included an SEP KU while three included SEP topics scattered throughout their KUs, as for these KAs this made more sense (e.g. Software Engineering had many SEP topics fall naturally across several KUs and removing these from those KUs to create a dedicated SE-SEP KU seemed more awkward). One KA (Mathematical & Statistical Foundations) did not require SEP topics. This design has the effect of making SEP topics *unavoidable*, regardless of if an institution delivers a dedicated SEP course or not. This also allowed the SEP KA itself to address broader topics that span many or all KAs. For instance, the foundational KUs Methods for Ethical Analysis, and Professional Ethics; and the addition of the DEIA KU mentioned above. Additionally, CS2023 provides several SEP curricular packagings allowing greater flexibility of topic/course delivery.

This tightly integrated approach required the SEP committee to interact deeply with the other 16 KAs. Additionally, community feedback was garnered through various channels including reviews, surveys and in-person [1, 3]. As these developments are new and potentially intricate, this poster is part of a drive to communicate how using CS2023, SEP can be effectively integrated into various institutional curricula via a combination of SEP being embedded in other KAs and/or through a dedicated course – ideally both.

[1] Computing Curricula 1991: dl.acm.org/doi/pdf/10.1145/2594148
[2] Computer Science Curricula 2013: dl.acm.org/doi/book/10.1145/2534860
[3] In CS curricular guidelines, knowledge areas (KAs) represent coarse CS areas (e.g. SE, HCI, etc.). These are then divided into more finely-grained knowledge units (KUs).

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REFERENCES

[1] Brett A. Becker et al. 2023. Community Input for CS2023: Society, Ethics and Professionalism. In *Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 2* (Toronto ON, Canada) *(SIGCSE 2023)*. ACM, NY, NY, USA, 1245. https://doi.org/10.1145/3545947.3573362
[2] Amruth Kumar, Raj Rajendra, et al. 2023. *ACM/IEEE-CS/AAAI Computer Science Curricula 2023: Curriculum Guidelines for Undergraduate Degree Programs in Computer Science.* ACM, NY, NY, USA. https://csed.acm.org/
[3] Rajendra K. Raj et al. 2023. Perspectives on Computer Science Curricula 2023 (CS2023). In *Proceedings of the ACM Conference on Global Computing Education Vol 2* (Hyderabad, India) *(CompEd 2023)*. ACM, NY, NY, USA, 187–188. https://doi.org/10.1145/3617650.3624928