

AI, Security, and Society: Lessons From CS2023 For Information Technology Education

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CCS CONCEPTS

• **Social and professional topics** → **Computer science education; Information technology education; Model curricula; Computing profession.**

KEYWORDS

Computer Science Curricula, Information Technology Curricula, Societal Considerations, Professional Ethics Education, Artificial Intelligence Education, Security Education, Cybersecurity Education

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Disciplinary computing curricula are periodically revised by the Association for Computing Machinery (ACM), in collaboration with computing societies that share educational goals, for instance, IEEE Computer Society, Association for Information Systems, American Statistical Association, and most recently, the Association for the Advancement of Artificial Intelligence. The most recent curricular report in the computing disciplines is Computer Science Curricula 2023 (CS2023) [1], the 10-year revision of Computer Science Curricula 2013 (CS2013) [4].

Curricular recommendations of the Information Technology (IT) Curricula 2017 (IT2017) report [3] are approaching the 10-year revision cycle, with significant changes in the computing technology landscape since 2017. In preparation for updating the IT curricular guidelines to reflect current and future developments of the IT discipline, profession, and technology, learning from the experiences of the CS2023 task force and understanding the CS2023 final report is useful and timely.

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This panel focuses on possible influences of three of the 17 CS2023 Knowledge Areas (KAs) on IT undergraduate education:

- *Artificial Intelligence (AI)*
- *Security (SEC)*
- *Society, Ethics, and the Profession (SEP)*.

While several of the other 14 CS2023 KAs remain important in overall IT education, the selected three have received extensive coverage in the media due to their increasing role in today's technological developments and the economic, political, and cultural aspects of our global society.

Among the ACM computing curricular recommendation reports, the first curricular report for the IT discipline, IT2008 [2], was also the first ACM report to define the KA of *Information Assurance and Security*. The IT2008 report highlights the significance of this KA along with the *Social and Professional Issues* KA by depicting them as overarching the IT fundamentals and IT disciplinary “pillars” of programming, networking, human-computer interaction, databases, and web systems in the famous ancient temple illustration of the IT discipline, as shown in Figure 1.

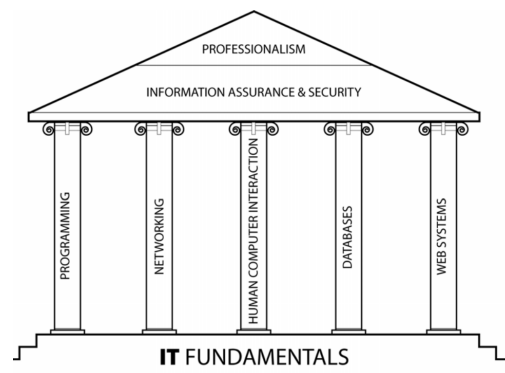


Figure 1: IT discipline illustration in IT2008 [2, p.19]

In the IT2017 [3] report, these KAs were given increased attention. The competency-based IT curricular framework of the report defines *Cybersecurity Principles* and *Global Professional Practice* as essential IT domains of competency that all IT academic programs are expected to include. Additionally, IT2017 ensured further preparation in these domains by listing *Cybersecurity Emerging*

Challenges and Social Responsibility competency domains as supplemental domains. What neither IT2008 nor IT2017 identified as belonging to the IT discipline was Artificial Intelligence.

The panelists will discuss the CS2023 curricular guidelines for the AI, SEC, and SEP KAs, and how future IT education could benefit from the CS2023 effort. Attendees will appreciate the approach taken by CS2023 toward these KAs of computing education, especially on how to educate the next generation of IT graduates.

1 PANEL PRESENTATION STRUCTURE

Table 1 outlines the panel structure and sets aside ample time for active audience participation.

Table 1: Panel Structure

	Description	Duration
1	Introductions and Background	3 minutes
2	CS2023 Vision	6 minutes
3	Panelists' Perspectives	24 minutes
4	Audience Q & A	24 minutes
5	Summary	3 minutes

2 POSITION STATEMENTS

The panelists' initial perspectives are presented here.

2.1 Raj (Moderator) – CS2023 Overview for IT

Rajendra K. Raj is a Professor of Computer Science at the Rochester Institute of Technology. He currently focuses on cybersecurity, data science, and computing education. Dr. Raj has held several leadership positions in ABET's Computing Accreditation Commission, including Commission Chair. He co-chaired the CS2023 task force and also led its Security KA.

Dr. Raj will outline how CS2023 [1] differs from the earlier CS2013 Curricular Guidelines [4], discussing the rationale for the differences and highlighting the CS2023 emphasis on Society, Ethics, and the Profession (SEP), as well as AI and Security. He will then introduce the panelists, pose relevant questions about possible impacts on IT education to the panelists, facilitate audience Q & A and discussion, and summarize the session.

2.2 Gorka – Security and IT

Sandra Gorka is a Professor and Department Chair of Information Technology at Pennsylvania College of Technology. She has been teaching information technology since 2000, most recently focusing on information assurance and cyber security. She co-authored IT2008: Curriculum Guidelines for Undergraduate Degree Programs in Information Technology [2]. Dr. Gorka currently serves as the Secretary/Treasurer of CSAB and as a member of the ABET's Computing Accreditation Commission's (CAC) Executive Committee.

Dr. Gorka will provide a brief overview of the CS2023 Security KA and discuss the ever-increasing need for security in all aspects of computing. She will discuss the importance of securing cyberspace and the entities and individuals that use it. Attention will be given to the importance of nurturing and mentoring IT students to guide them in developing a security mindset.

2.3 Sabin – Artificial Intelligence and IT

Mihaela Sabin is a Professor of Computer Science at the University of New Hampshire. Her teaching experience includes foundations of programming, data structures, software engineering, capstone project and team project development, and artificial intelligence. Dr. Sabin chaired the IT2017 task force. She serves on the SIGITE Executive Committee as Vice Chair for Education, the ACM Education Council, and the CSAB Board.

Dr. Sabin will summarize the CS2023 AI KA and related competencies and discuss their relevance in today's technological landscape. She will focus on the benefits, limitations, risks, and misinterpretation of AI technology as it is portrayed in the media, embraced by industry and investors, and critiqued by professional groups and governmental agencies. AI's multifaceted impacts on people's daily lives and society pose immediate and consequential questions about what AI-related competencies IT academic programs should develop in IT graduates.

2.4 Servín – Societal Considerations and IT

Christian Servín has contributed to computing education, serving most recently on the CS2023 Steering Committee, where he chaired the Specialized Platform Development KA subcommittee and participated in multiple subcommittees. He has also served on other ACM task forces on curricular guidelines, including cybersecurity and data science. Dr. Servín currently serves on the SIGITE Executive Committee.

Dr. Servín will discuss societal challenges posed by the growth of all computing disciplines, especially information technology. An early decision by the CS2023 task force was to make *Society, Ethics and the Profession* KA unavoidable for students and faculty alike. The rapid propagation of fake news over social media requires an educated population, and information technology graduates must be prepared to deal with these situations. He will examine the infusing of SEP into all of the CS2023 KAs, and explore the impact on the path forged earlier by IT2017 [3].

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