

Innovations and Challenges: Multimodal Learning in Cybersecurity

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Abstract : There is rapidly growing demand for professionals to fill positions in Cybersecurity. This is recognized as a national priority both by government agencies and the private sector. Cybersecurity is a very wide technical area which encompasses all measures that can be taken in an electronic system to prevent criminal or unauthorized use of data and resources. This requires defending computers, servers, networks, and their users from any kind of malicious attacks. The need to address this challenge has been recognized globally but is particularly acute in the New York metropolitan area, home to some of the largest financial institutions in the world, which are prime targets of cyberattacks. In New York State alone, there are currently around 57,000 jobs in the Cybersecurity industry, with more than 23,000 unfilled positions. The Cybersecurity Program at City College is a collaboration between the Departments of Computer Science and Electrical Engineering. In Fall 2020, The City College of New York matriculated its first students in the Cybersecurity Master of Science program. The program was designed to fill gaps in the previous offerings and evolved out of an established partnership with Facebook on Cybersecurity Education. City College has designed a program where courses, curricula, syllabi, materials, labs, etc., are developed in cooperation and coordination with industry whenever possible, ensuring that students graduating from the program will have the necessary background to seamlessly segue into industry jobs. The Cybersecurity Program has created multiple pathways for prospective students to obtain the necessary prerequisites to apply in order to build a more diverse student population. The program can also be pursued on a part-time basis which makes it available to working professionals. Since City College's Cybersecurity M.S. program was established to equip students with the advanced technical skills needed to thrive in a high-demand, rapidly-evolving field, it incorporates a range of pedagogical formats. From its outset, the Cybersecurity program has sought to provide both the theoretical foundations necessary for meaningful work in the field along with labs and applied learning projects aligned with skillsets required by industry. The efforts have involved collaboration with outside organizations and with visiting professors designing new courses on topics such as Adversarial AI, Data Privacy, Secure Cloud Computing, and blockchain. Although the program was initially designed with a single asynchronous course in the curriculum with the rest of the classes designed to be offered in-person, the advent of the COVID-19 pandemic necessitated a move to fully online learning. The shift to online learning has provided lessons for future development by providing examples of some inherent advantages to the medium in addition to its drawbacks. This talk will address the structure of the newly-implemented Cybersecurity Master's Program and discuss the innovations, challenges, and possible future directions.

Keywords : cybersecurity, new york, city college, graduate degree, master of science

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