Thesis Project Portfolio

Recommendations for UVA Computer Science Curriculum to Create Industry Ready Graduates

(Technical Report)

Attitudes Towards AI Generated Art

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

The goal of this capstone project is to understand what aspects of UVA's computer science curriculum should change in order to meet the future needs of industry. Meta analysis of research relating to the topic of creating industry ready developers during undergraduate studies is examined. More specifically, I compare non-traditional curriculums, such as programs that include open source projects or that were created for experimental purposes, to UVA's traditional computer science program. Additionally, the research considered the advantages and disadvantages that coding bootcamps present in comparison to traditional curriculums. It is important to consider the human and social dimensions of this project in order to create competent software developers who are industry ready and are able to maintain the massive amount of software and technology that already exists.

The STS research attempts to better understand the existing opinions of art generated by artificial intelligence. In order to better understand this problem, a specific model, DALL-E, was selected. If negative opinions from AI generated art are derived from the technology in question, then there are possibilities to improve the technology. Due to the increasing prevalence of image generation with AI, considering the human and social dimensions of the technology is important, so that we can improve the technology in accordance with those who will use it. Latour's concept of actor network theory can be applied to help solve this problem. Particularly, when considering the technology in terms of prescription, circumscription, and description. When defining the technology with these three categories, we can begin to address possible technological deficiencies. This research question was addressed by asking subjects to complete a survey. The survey consisted of rating an image generated by DALL-E before and after the model's mechanisms were explained. Afterwards, subjects were asked a series of qualitative questions to

better understand their opinions on AI generated art and whether understanding the mechanisms of the model changed their opinions on the technology as a whole. Using the Wilcoxon-signed rank test the rejection threshold was set to be 0.05 and the null hypothesis was: there will be no significant difference of ratings for the image before and after the model is explained to the participants. It was concluded that we fail to reject the null hypothesis; thus, people's perception of AI generated art did not change with a better understanding of the DALL·E model's mechanisms.

Speaking in broader terms of AI and CS education, we might have to reconsider how the CS curriculum in higher education is taught. This problem stems from the expanding capabilities of AI. Particularly, this issue arises with technologies such as ChatGPT which can do students' coding homework for them.