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CISC 480- Senior Capstone

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Final Paper

Senior Portfolio

Over the past four years at St. Thomas, I have received more than just an education in computer science and data analytics. The University of St. Thomas takes a great deal of pride in its liberal arts education and its mission to raise scholars who “think critically, act wisely, and work skillfully, all for the common good”. In my time as St. Thomas, I have found many opportunities in my classes to advance the mission of the university while developing my own skills as a student and a programmer. In the past year alone, I’ve had classes that directly addressed issues such as diversity in education and academia, the role of religion in a Catholic university, and how sustainability could be implemented individually and systemically. But the problem that most interests me was one I encountered regularly in my work as a tutor.

I have been a statistics and computer science tutor for the past 3 years. During that time, I’ve had students of all skill levels stop into my tutoring hours to get help on introductory course material. What I heard, time and time again, was that students felt totally inexperienced when it came to programming. “I’ve never had to do anything like this before”, “I don’t understand what this even does”, and “When will I ever use something like this?” are all phrases that I have committed to memory. Introductory Statistics is a required course at the University, so these students came from all sorts of majors, but this sentiment was universal. To me, this shows a huge problem in how students are educated about computer science and technology. My peers did not have any exposure to the concept of programming and computer science before college! This drastically reduces their likelihood to pursue a career that involves programming, widening the diversity gap in computer science. It also discourages them from pursuing a higher level of technological literacy. If algorithms, artificial intelligence, and smart devices are all just black boxes and you are unable or unwilling to learn how and why they operate, it becomes much more difficult to think critically when algorithms choose the media you see, more difficult to act wisely when artificial intelligence suggests course of action for you, and more difficult to work skillfully when smart devices continue to replace jobs, one industry at a time. I strongly believe that a basic understanding of programming, statistics, and computer science is a mandatory element of a well-rounded education, and it is a serious problem that most students are not gaining this at St. Thomas.

A 5-page (double spaced, Times New Roman 12pt font, 1-inch margins) reflection essay on how the work included in the e-portfolio connects to a problem of interest to you and to the common good and/or St. Thomas's mission and values.

Outline

1. Intro
2. The problem of inexperience: how smart and capable students shy away from computer science
3. How I’ve encountered this problem
   1. tutoring
   2. family and friends
4. How my projects connect
   1. Two way directed graph- easy question, hard answer
   2. Pipelined Architecture- rudimentary computer simulation
      1. shows how programming and computer science forms the backbone of modern society
      2. encourages thinking about the role of programming in daily life
   3. Excel Spreadsheet
      1. Used to showcase programming in a familiar format
      2. Even people with no interest in coding enjoy a game
      3. first values, then buttons, then macros: tiered introduction
5. How I plan to continue working on this problem after graduation
6. Conclusion