10/9/2020

Personal Statement:

As a recent college graduate, I am particularly interested in studies that support my further growth and development in the field of data science. My undergraduate degrees are a Philosophy major, with a Biology minor; these disciplines directed my intellectual focus to symbolic logic and how it relates to the world. Although my degree isn’t in data science, studying the relationship between the focus of my degrees and computer science is essentially the closest subject to a data science degree offered at Lawrence University.

My work in this field examines the intersection between physical sciences and modern conceptions of computer science and logic. I am skilled at statistical modeling with an emphasis on finding correlations that can be used in a pragmatic way. I’m particularly interested in making useful graphics out of statistics tests and their datasets. In a R project focused on COVID-19 I created a pretest statistics calculator that determines the pre-test and post-test probability of a positive COVID-19 test based on regional data and symptoms. Its output also determines the Sensitivity and Specificity, as well as the probability of getting a true positive result or a false negative result. The final product of this program is a chart that illustrates where Pre-test Probability intercepts the probability of getting a true positive or negative result. Based on this output it is possible to determine if a factor could be used to accurately pretest for COVID-19 especially when using this program in conjunction with a test for collinearity. I wrote this program for COVID-19 test distributer Sense Technologies to assist in communicating COVID-19 test results to customers, especially in cases where the test might not have correct results. This program is a way to determine the probability that someone in a specified demographic will test positive for COVID-19 before giving them the test. My secondary focus on Biology has made me particularly good at working with large amounts of inconsistent data and data verification projects like the COVID-19 datasets. I am a big fan of Bayesian methods because of their versatility, but I have plenty of experience with the standard statistical methods commonly used in scientific papers. For example, one of my projects was a program that verified the statistical tests done by researchers who published a study titled *Revisiting the Tryptophan-serotonin deficiency and the inflammatory hypotheses of major Depression in a biopsychosocial approach* which claimed that lower levels of the amino acid tryptophan in blood were an indicator of depression. My program redid the researcher’s hierarchical linear model and found that the researchers reasoning for removing certain collinear variables from the hierarchical linear model was not fully valid.

Additional areas of my computer science expertise include machine learning algorithms (my favorites are boosted regression trees and monte carlo markov chains), coding languages (R, Java, some Python), SQL, web design, ArcGIS map making, and the statistical tools for scientific analysis. Some less practical things that I enjoy are botany, woodworking, audio production, discussing philosophical topics (it’s important to know whether people are an epistemic relativist or absolutist), mathematical proofs (cantors diagonal argument is my favorite), literature (I love to collect Borges’s short stories).

In my studies, statistical modeling has proven its potential as a mechanism to reveal useful patterns that may not be noticeable at first glance. Although the bulk of my projects were generally performed in a scientific context with laboratory data, these skills are very versatile and can be applied to any situation where data is collected. While my main goal for seeking higher education is to further my career in data science, I am interested in learning about ways to apply these skills to other more pragmatic fields in computer science. As a newcomer to the field, I would love the opportunity to learn from the staff at The Ritchie School of Engineering and Computer Science. I believe getting a master’s degree is going to be essential for furthering my career generally and the University of Denver would be the perfect place to earn one. Thank you for your time and consideration.