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STS 4600

29 April 2021

### Socio-technical Synthesis: Machine Learning in Justice System

My technical work and my STS research are connected primarily through the idea of machine learning in the justice system, especially the algorithm and impact of risk assessment tools. My technical work focuses on the algorithm behind risk assessment tools on how it can produce biased results, and my research explores the moral issues of risk assessment tools.

My technical work focuses on the algorithm behind the risk assessment tools, and explores different ways to find sources of bias on the algorithms. I use different machine learning algorithms, such as Random forest and Association rule mining, to find any relations in the datasets. For example, I compare the calculated risk assessment scores and other information that was collected on the questionnaire about a defendant such as sex, age, and gender. Using Random forest and Association rule mining, I check if there are any correlations between the attributes. With the results, I was able to find out what highly affects the risk assessment most, such as race. The goal of my technical work is to explore the algorithm and find ways to make it less biased to help produce more accurate results.

My STS research also explores risk assessment tools in a similar angle. I focus on the moral issues of using risk assessment tools as it is known to produce biased results. Using Actor Network theory, I explore all actors that are related to the risk assessment tool network and discuss how risk assessment tools have affected them. I specifically look at the case of Wisconsin v Loomis (2016) to discuss the unfairness of risk assessment tools. The goal of my

research is to raise awareness on the negative impact of risk assessment tools and ask for careful use of the tools in the justice system.

Working on these two projects simultaneously greatly added value to both. My technical work gave me a better understanding of the algorithms behind risk assessment tools and how machine learning is used in the justice system. It also gave me a better understanding of machine learning itself, on various algorithms that are available. Similarly, the research I conducted for my STS paper helped me learn how algorithms can be used in the justice system and how the outcome can be negatively affected. In summary, working on both my STS research paper and my technical project together this past year has allowed me to explore machine learning from multiple angles and has helped me raise awareness on how I should be careful when designing an algorithm as it can produce negative consequences.