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## **Scoliosis Stigmatization and the Patient Experience**

Sociotechnical Synthesis

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By

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Signed: \_\_\_\_\_

*Victoria Spina*

Date 05/01/2020

## Conference Abstract

My research addresses the negative stigmatism behind having the genetic condition, Scoliosis. The condition is characterized by an abnormality of the spine, causing it to curve and appear crooked and disproportional. The technology we are creating to address this problem involves the creation of a less invasive method that will reduce the destructive appearance and symptoms of the condition. Further, we are creating a machine learning algorithm that will measure the degree of spinal curvature automatically. The algorithm was a convolutional neural network(CNN) designed to detect features of real patient de-identified spinal x-ray images. The x-ray images were given to us by a company called Minimally Invasive Spinal Technology (*MIST*). The images underwent pre-processing using a series of MATLAB functions in order to assist the algorithm in feature detection. Essentially, the result of the image pre-processing lead to enhanced image contrast, increased sharpness and noise reduction around pixel regions. Proceedingly, the x-ray images underwent what we referred to as spinal trace identification. Here, the images were run through a MATLAB algorithm that highlighted and outlined the spine in order to allow the CNN to measure the cobb angle. It is important to consider the human and social dimensions of this technology because the technology could serve as a huge tool for future patients and doctors. Doctors will be able to offer better and more appealing treatment approaches and patients will be less subject to physical and emotional abuse from having Scoliosis. Additionally, doctors valuable time will be better spent elsewhere as the algorithm decreases the time it takes to measure the cobb angle, therefore increasing patient throughput. The computational method will also allow for a more accurate diagnostic method, as the previously hand-drawn method is error prone. One of the STS theories that applies to my approach is the actor network theory. As current treatment methods are extremely outdated, the need for a less invasive, and advanced, technological approach pushes the development of this technology(technical determinism). Additionally, the need for a treatment option that reduces the constraints of having scoliosis and the negative stigmatism that follows societally supports the innovation(social determinism). I am planning to use the actor network theory to show the need for the development of this technology from both the patient and doctoral perspectives Through my research I expect to find negative patient experiences with Scoliosis and how it has unsympathetically impacted their lives. From the doctor perspective, I hope to find information regarding the inaccuracy and ineffectiveness of current treatment approaches. The implications that can be drawn from my technology would be a more accurate and more efficient diagnosis and treatment of Scoliosis. Additionally, there would be a positive effect on society in regards to resolving both world and patient's view on scoliosis and patient's mental health.