**Research Project Proposal By Aryan Deorah**

**Objective**

The object of this project to determine the effect that different gun laws have on different categories of gun violence. This project will determine which laws reduce gun violence the most. This will be accomplished through creating a machine model for the effects of gun laws on gun violence. If this does not work, it can still be accomplished through various statistical tests. Hopefully, this research will provide data for lawmakers to view when making gun laws and therefore making the world a safer place.

**Justification**

The gun violence epidemic has grasped America for decades, and for the first time since the 1980’s firearm death rates are steadily increasing. In 1996, congress banned any government funding for gun violence research, leaving it up to private institutions to conduct this relevant research. Gun violence claimed over 32,000 lives in the U.S. in 2015, translating into a death rate of 11.3 per 100,000. This death rate increased to 11.8 per 100,000 in 2016. Room for improvement is shown by the fact that there is great variation in gun violence from state to state. Though there is considerable research and statistical tests on the effect of gun laws on gun violence, there is limited research focusing in on state and local laws. In addition to this, machine modeling has had limited application to gun violence, making this project unique. This project will be practical because all it requires is coding and accessible data.

**Description**

Firstly, the gun violence death rates will be compiled by categories such as state, municipality, and average income. Next, the gun laws in states and municipalities will be categorized by type of law and compiled into binary matrices. These matrices will then be inputted into a supervised machine learning system. The parameters will be defined, and data layers will be created. This system will then use a code kernel called TensorFlow to process the data. Before the data can be processed, the TensorFlow system will be trained by comparing its outputs to expected outputs and self-correcting until the system’s outputs are accurate. This will create an accurate model in which the original inputs will be inputted, and reasonable predicted outputs will be outputted.

**Limitations**

As with any project, this project will have limitations. Firstly, the person conducting the research has limited code experience, so creating the systems and coding the TensorFlow will take much time. Secondly, the expected outputs may be inaccurate and are limited, which will reduce the overall accuracy of the system. Because of the limited expected outputs, infeasibly large amounts of data may be required to create the system. In addition to that, if the expected outputs are invalid, then an unsupervised system may have to be used, and there is limited knowledge on unsupervised machine learning. Extra code and large amounts of data will be required to create an unsupervised machine learning system, which are highly inaccurate and therefore can be inconclusive. Finally, since the gun laws are not quantifiable, the binary matrices may not be able to accurately represent the gun laws in the system.