1145-97-2084   **Riley Jayne Anderson*** (`randers6@mail.umw.edu`). *Implementing Machine Learning to Improve Bertini 2.0.*

The purpose of this research is to decrease the run time of Bertini, a program that approximates roots of polynomial systems. Bertini can be run more efficiently if it is known whether a polynomial is singular or non-singular. In this research, we focus on polynomials in one variable. We create a machine learning algorithm to classify polynomials in to these two categories. To do so, we create and use a training set of polynomials to train a neural network and create a model. Then, we create and use a test set to assess the accuracy of the model. Through a process of training, evaluating, and changing the hyper-parameters of the neural network, such as the network architecture and learning rate, the accuracy of the model is able to be increased.

(Received September 24, 2018)