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*Comp Sci Undergraduate*

**CIS 467 – Term Project Proposal**

Poker with Python

**Problem Description**

This project will use machine learning and python, more specifically sklearn. The final product will use regression, classification, and clustering to examine a poker hand data set originally created by Franz Oppacher and Robert Cattral. Once the machine gets comfortable with the data set, it, in theory, should be able to outplay a human player in a series of poker/card games including Texas hold’em and five card draw.

**Motivations**

Machine learning is arguably one of the most important parts of artificial intelligence. I personally created a very simple poker game in java code my freshman year and noticed a lot of problems with its efficiency being that the machine was just too predictable. A simple card game will be the quickest way for a machine to learn and make it easy for humans to interact with this new machine.

**Nature of the Proposed Work**

This project would be considered an applied project. Personally, applied projects tend to be the most rewarding to finish as well as the ones I learn the most from. Applying what I know is a great way to test whether or not I actually know it. While the project relies heavily on theories learned in class, the final product of this project will be working code.

**Methods**

* Python – The project in its entirety will be written in the python coding language. There are lots of machine learning libraries readily available for users at absolutely no cost. It is easy to practice machine learning in this sort of environment. Python is available for everyone and can be downloaded from their website: <https://www.python.org/downloads/>
* Scikit-Learn – Also known as sklearn, it is a machine learning library for python. It is open source and accessible to anyone willing to use it. It includes simple and efficient tools for data mining and data analysis. It is built on prior python libraries including NumPy, SciPy, and matplotlib. It can be accessed from its homepage: <http://scikit-learn.org/stable/>
* Poker Hand Data Set – This free to download dataset is provided by the UCI Machine Learning Repository. We will be using this data set to try and teach our machine to become familiar with cards and the game of poker. Each record is an example of a hand consisting of five playing cards drawn from a standard 52 card deck. Each card has two attributes, suit and rank. The data set also recognizes poker hands and their winning values. This specific data set can be downloaded from: <http://archive.ics.uci.edu/ml/datasets/Poker+Hand>

**Timeline**

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| **Date:** | **Milestone:** | **Demonstration:** |
| 10/27 | Initial project ideas have been researched and a final topic has been decided. Term Project Proposal Submitted. | Term Project Proposal |
| 10/31 | Personal Computer has been set up with a fresh, up to date install of Python, a stable release of sklearn, and the poker data set. | n/a |
| 11/17 | The first compliable prototype of the code will be finished. Debugging will begin after this. | Prototype #1 – Source Code  *Project demo will be available* |
| 11/27 | Second prototype should be completed. This prototype should have little to no errors and look very similar to what will be the final product. | Prototype #2 – Source Code  *Project demo will be available* |
| 12/6 | Final Product will be completed and be presented to the class. | Final Product – Source Code  *Demo will be presented to entire class during lecture.* |