

# Machine Learning of the College Admissions Process

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## Abstract

The goal of this project is to analyze the various biases that exist in the college admissions system by attempting to predict college decisions. This project will attempt to reduce college admissions to pure numbers, excluding data that is inaccessible such as essays and teacher recommendations. Past user-submitted data from the 2007, 2008, and 2009 *Senior Destinations* websites will be used to train an artificial neural network in a process known as machine learning. Then, factors such as the gender bias and the race bias will not only be shown to exist but will be quantifiable.

## Intermediate Results

Currently, my only results are college predictions based on sigmoidal models of SAT and GPA. The college which is best predicted with those models is the University of Virginia. For the GPA multiplier, the neural network gives :  
 $f(x)=(1/1.00026+e^{(9.28027(3.68945-x))})$ .  
For the SAT multiplier, the neural network gives:  
 $f(x)=1/(1.05321+e^{(.00583(1778-x))})$ .  
These two functions are plotted below. If we combine these, we can get a rough estimate as to how likely it is a student will get in to the school. This is shown on the 3D graph below.

senior destinations  
TJ CLASS OF 2010

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Gender:  M  F  Clear

Race:  Asian  Black  Native American  Pacific Islander  White

Hispanic?:  Yes  No  Clear

GPA:

SAT (2400 Combined):

SAT (2400 Single):

SAT (1600 Combined):

SAT (1600 Single):

ACT (Combined):

ACT (Single):

Honors/Extracurriculars  
USAMO Qualifier  
USACO Silver Division  
National Hispanic Scholar  
National Merit Semifinalist  
Winner - 2008 GWU Math Bowl

