

# Josh Konowitz - NFL 4th Down Analytics

**PROBLEM:** NFL coaches currently use a 'gut' decision-making process on 4th down, resulting in punting on 75% of 4th downs

**SOLUTION:** Using machine learning to provide insights for coaches in order to help them make the most optimal decision

**TECHNOLOGY:**



NumPy



learn

pandas

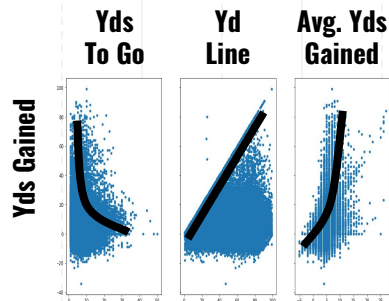
$$y_{it} = \beta'x_{it} + \mu_i + \epsilon_{it}$$



ANACONDA

Powered by Continuum Analytics

## PREDICTING OUTCOMES:



**RANDOM  
FOREST  
REGRESSOR  
MODEL**

**Predictions Average Error:**

**Yards Gained: 4.66 YDS**

**Punt Distance: 7.41 YDS**

**FG Completion: 11.56%**

**First Downs: 14.15%**

**RANDOM FOREST  
REGRESSOR  
MODEL  
(+ more data)**

**Insights:**

**WIN %**

**EPA (Expected Points)**

**Calculate Insights using  
predictions for each  
option:**

1. Punt
2. Field Goal
3. Going for 1st

**Learning  
Outcomes:**

Machine Learning, Python Libraries,  
Data Science, Project Management

**Achievements:**

Over 35 Million Cells of Data  
Over 300 Lines of Code