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
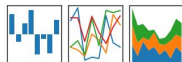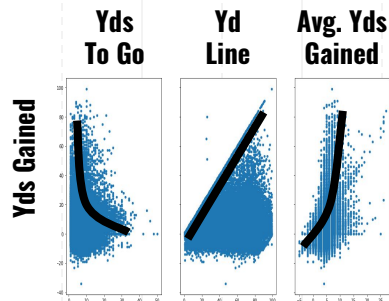
TECHNOLOGY: Jupyter python NumPy scikit learn pandas $y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$ ANACONDA Powered by Continuum Analytics®

PREDICTING OUTCOMES:

Yds To Go   Yd Line   Avg. Yds Gained

Yds Gained

→ **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 3000 Lines of Code