

# Predicting Financial Markets: New Modeling Horizons

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# Overview

- Predicting Next Day's Movement:
  - US Treasury Yields
  - S&P 500
  - GLD
  - OIL
- Features:
  - 500 daily time series
  - 2006 – Present
  - Source: St. Louis Federal Reserve

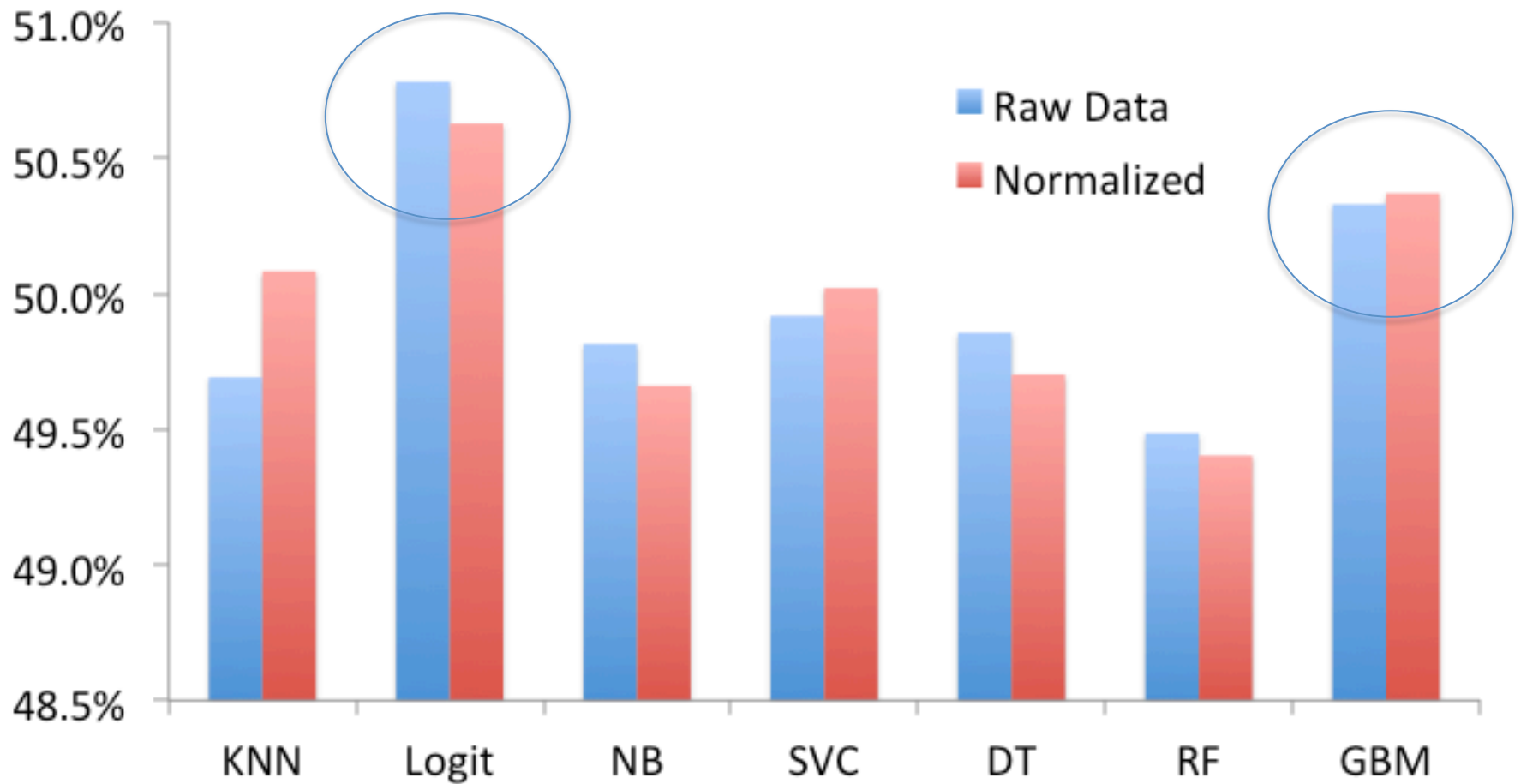
# Data Issues and Preprocessing

- Avoid Look-Ahead Bias
- Trained on various rolling windows and predicted next day's market movement
- Normalized features

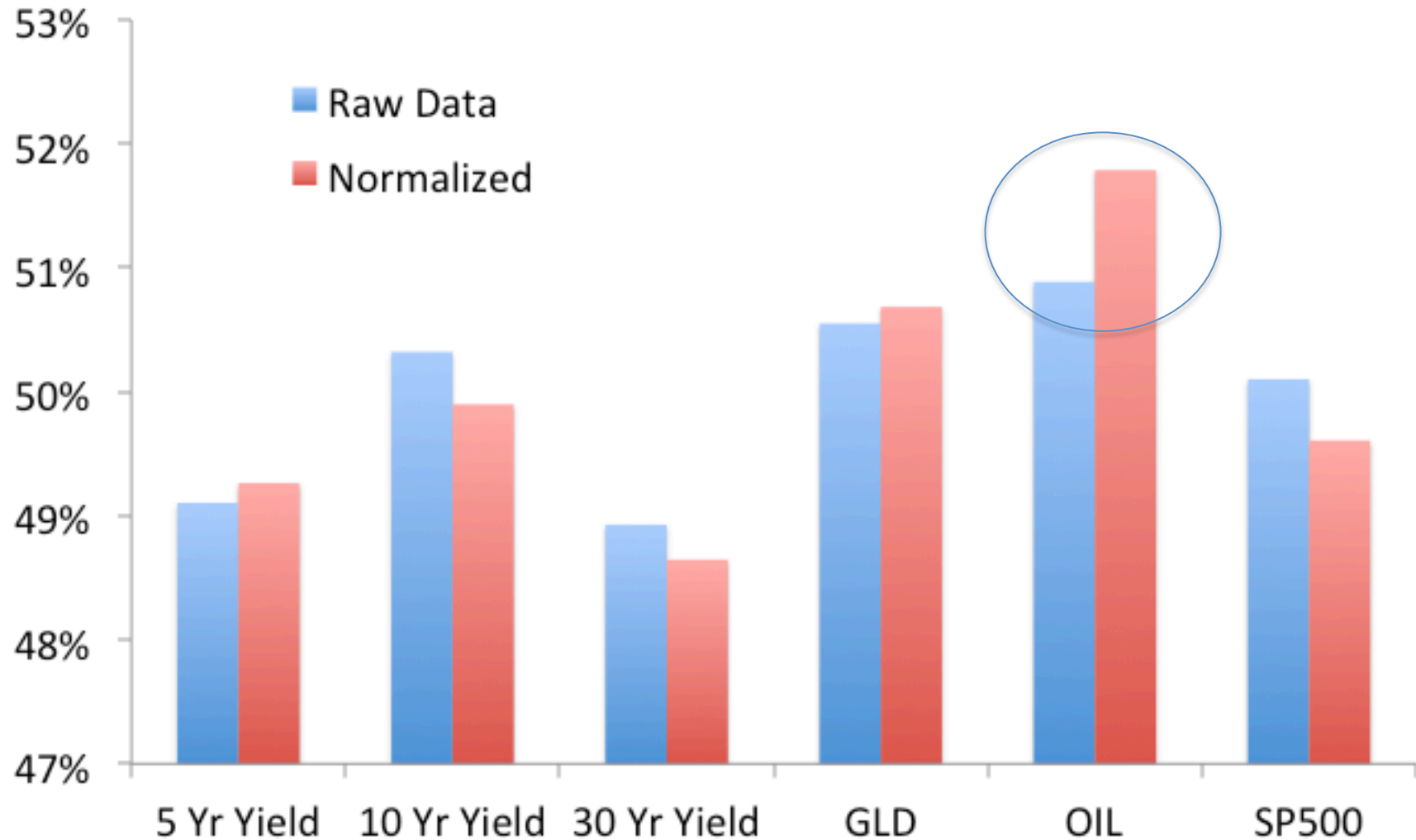
# Methodology

- Using traditional classifiers:
  - Find the best-performing algorithm
  - Find the most predictable market
- Develop neural net architectures competitive with the state of the art

# Average Accuracy By Algorithm Across All Markets



# Average Accuracy By Market Across All Algorithms



Can We Do Better with  
Neural Networks?

# Feed Forward Neural Networks for OIL prediction

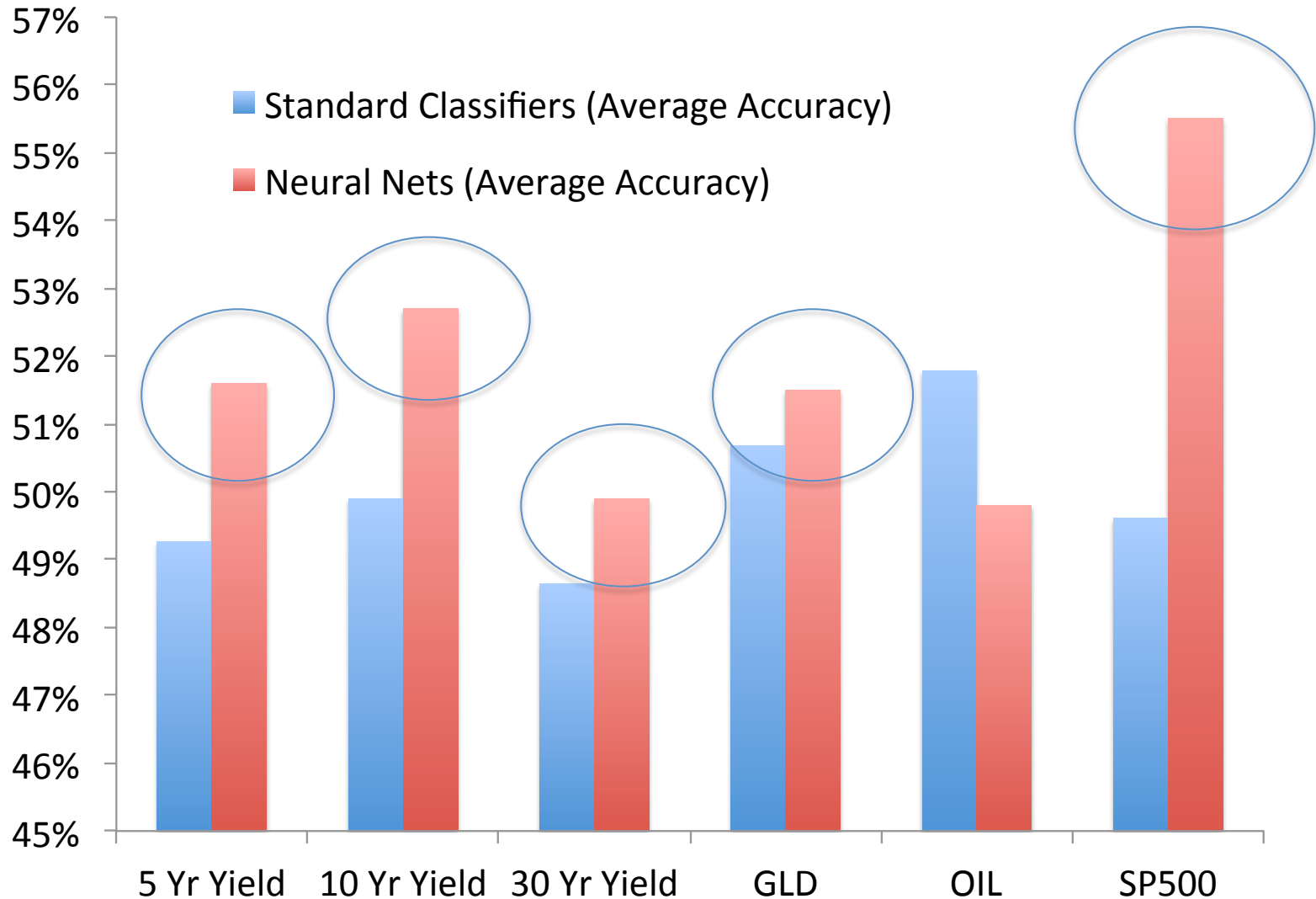
- Used Nolearn to implement Feed Forward Neural Networks
- 84 different architectures
- Results:
  - Highest accuracy was 54.48% vs. 54% for Logistic



# Recurrent Neural Networks for OIL prediction

- Used PyBrain to implement Recurrent Neural Networks
- 28 different architectures
- Results:
  - Highest accuracy was 54.28% vs. 54.48% for Feed Forward Neural Networks

# Average Accuracy By Market Across All Algorithms



# Average Accuracy By Algorithm Across All Markets

