Machine Learning in Portfolio Management

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Approach and Objective

Goal: Generate alpha by creating situational trading algorithms

- Background:
  - Mean absolute daily move 1.1%
  - 52% Accuracy leads to losses/break-even
  - 56 % Accuracy leads to phenomenal profit
  - 4% improvement over break-even accuracy leads to 8.8% profit every 100 days, which is huge!
  - Working very close to randomness
- Experiment
  - Daily signals generated randomly 100 times
  - Best random system accuracy: 53.1%
  - Worst random system accuracy: 47.3%

AI Labs Video

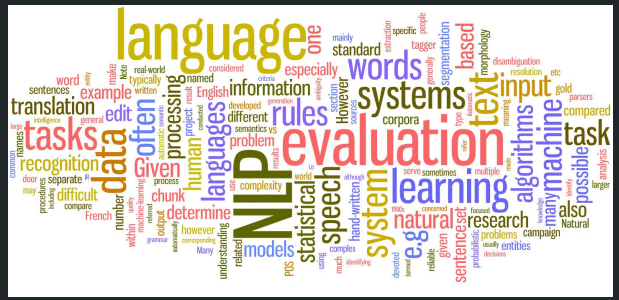
https://www.youtube.com/watch?v=IDa-__vHCyo

Factors Used in Machine Learning - Example

- Equity exposure in the S&P 500 index (SPX)
- A long/short position between Russell 2000 index and S&P 500 index (RTY)
- A long/short position between DJ Eurostoxx 50 index and S&P 500 index
- Long/short position between TOPIX index and S&P 500 index (TPX)
- Long/short position between MSCI EM index and S&P 500 index (MSCI EM)
- An exposure in the 10Y US Treasury bond position (UST)
- FX position between Euro and US Dollar (EUR/USD)
- FX position between Yen and US Dollar (JPY/USD)
- Exposure in high yield (HY)
- Exposure in emerging bonds (EMBI)
- Exposure in commodities (GSCI)
- Exposure in gold (GOLD)

Sentiment Analysis

- Build NLP tools for News Analytics
- Real time - do not analyze every word but use Deep Learning to analyze sentences/phrases
- Large moves occur on earnings releases, quarterly projections, new products, etc.
- Factors CEO ratings, employee sentiment



Risk vs Reward in Portfolio

- Want to minimize the risk in the portfolio while maintaining reward
- Find maximization for risk/return given a certain amount of capital
- Look across different asset classes and the risk scores
- See how diversification affects the portfolio
- Maximize Sharpe Ratio