Exploring Fatigueness Measurement and its Effect on Athletic Performance

Team MuMuMu

Team Members:

- Yu Li
- Zhen He Liu
- Malcolm Lin
- Justin Ip

Predicting Fatigue Rating

Comparison Over Two Regression Types (Test = 0.6)	
OLS regression	**Random Forest**
Adj R-Squared: 94.7%	n_estimators=20
Mean Absolute Error: 3.518	Mean Absolute Error: 0.708
Mean Squared Error: 13.169	Mean Squared Error: 0.851

(1) **Initial Predictors:**
- SessionLoad
- AccuteLoad
- ChronicLoad
- SleepHours
- SleepQuality

Heatmap of predictors

Player Training Breakdown
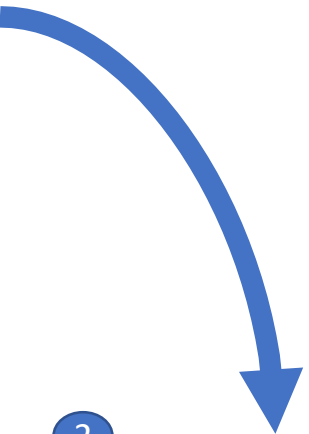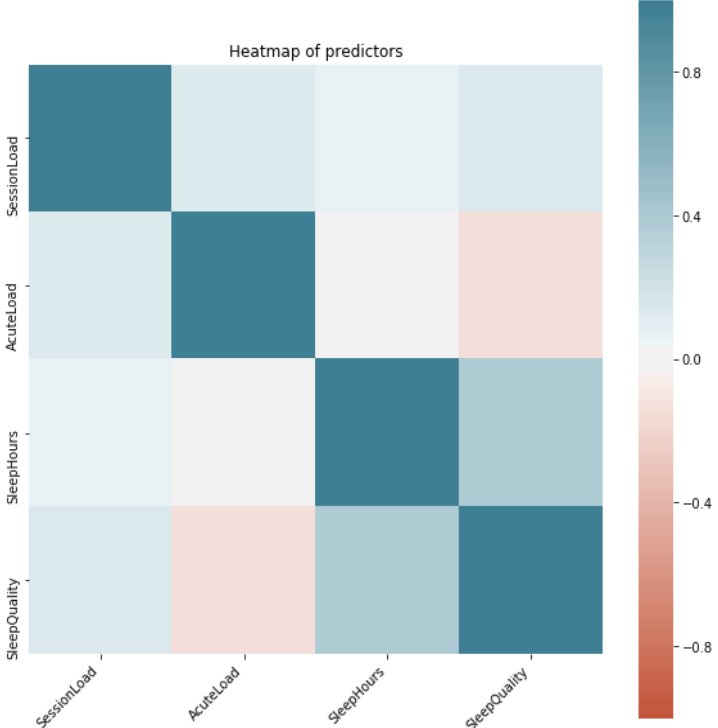
(2) **New Predictors:**
- PlayerID
- SessionType
- SessionLoad
- AccuteLoad
- SleepQuality
- SleepHours

Top Insightful Parameter - PlayerID
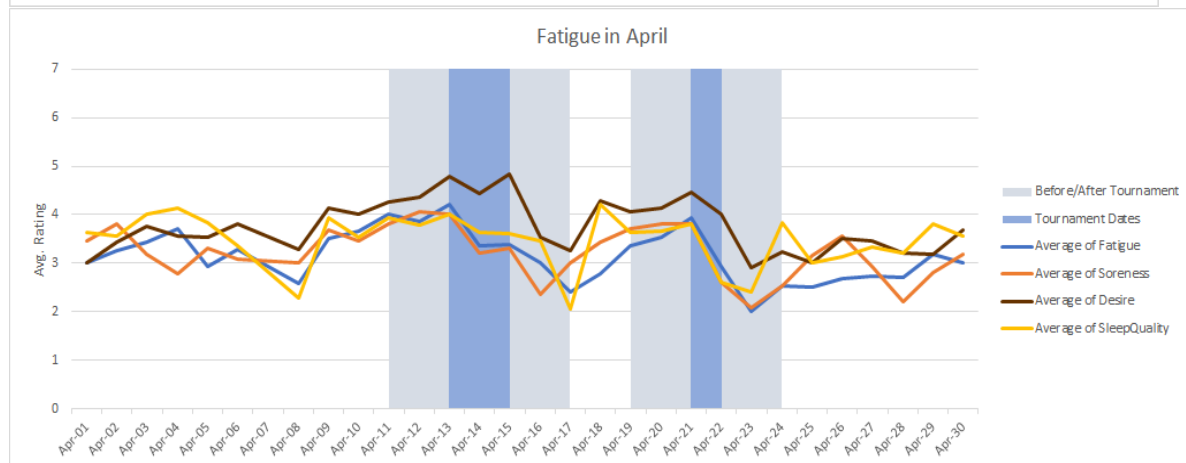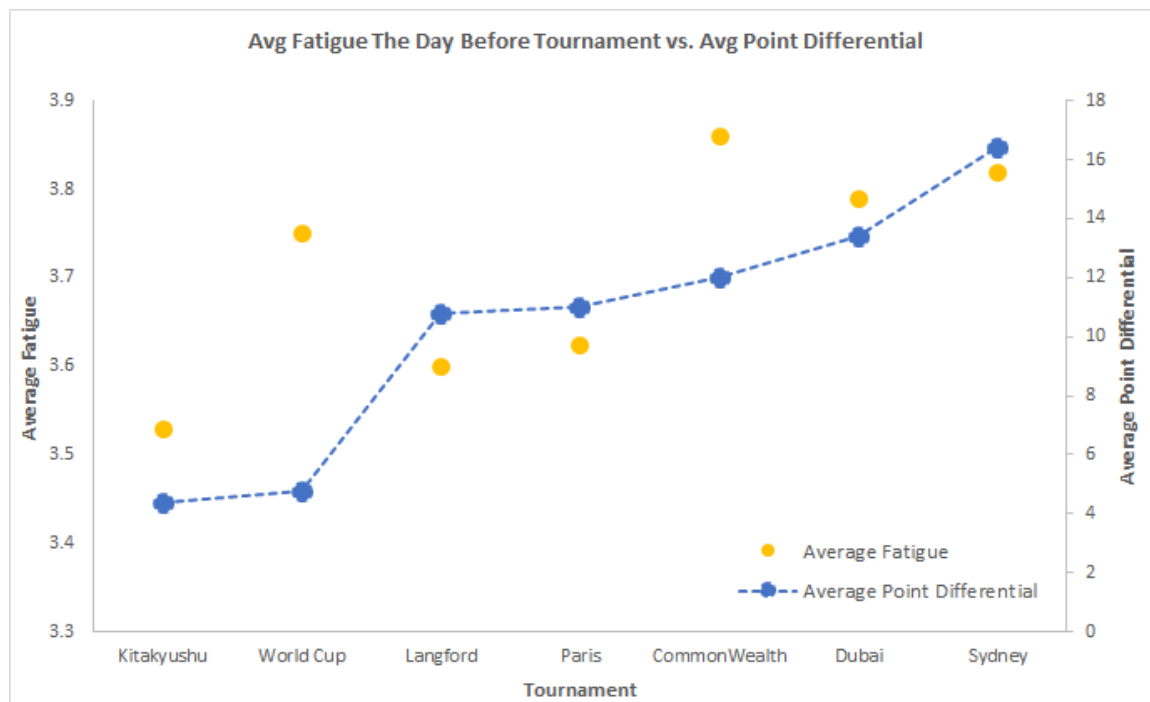- Players practice different skills which will impact their overall fatigue.

Random Forest
Mean Absolute Error: 0.544 Mean Squared Error: 0.507

Insights

Avg Fatigue The Day Before Tournament vs. Avg Point Differential

Fatigue in April

Conclusions:

- Fatigue is a good indicator for performance during tournaments
  - However, opponent quality outweighs Fatigue impact

HSBC Women Rugby 7 All Time Points

Pos	COUNTRY	Points Scored (2017-2018)
1	New Zealand 7s	703
2	Australia 7s	560
3	Canada 7s	511

- Fatigue is measured based on individual

- AcuteLoad is a better indicator of Fatigue than ChronicLoad

- Distance traveled during games is not a good indicator for Fatigue

Next Steps:
- Perform feature engineering on player characteristics