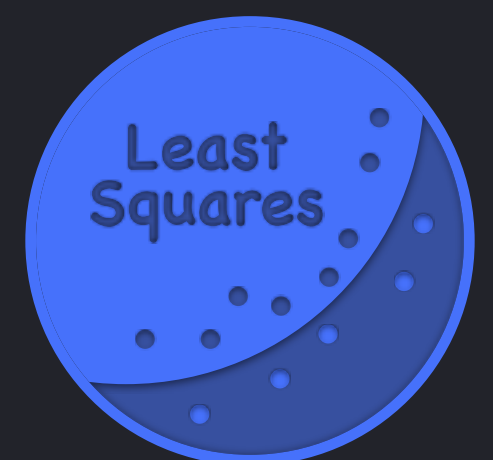


# The Great Debate:

## Subjective vs. Objective Measures to Predict Holistic Fatigue

Anna Berman, Lidia Azucena Morales Vasquez, Sicong Zhao, Yifei Wang, Viggie Kumaresan

Proudly Presented by  
Least Squares



Problem

What is the best way  
to monitor  
holistic fatigue?

Solution

Objective Game Features > Subjective Data

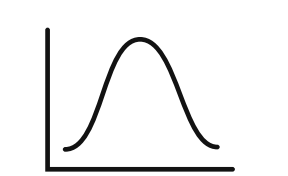
Our Approach

1 Literature Review

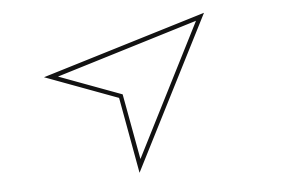
2 Outcome Definition

- Holistic Fatigue
- High Holistic Fatigue

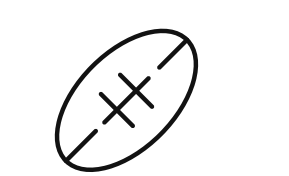
3 Feature Engineering




Normalization



Motion (7)



Game Flow (9)



Weather (4)

4 Modeling Comparison

Subjective

Objective

Subjective + Objective

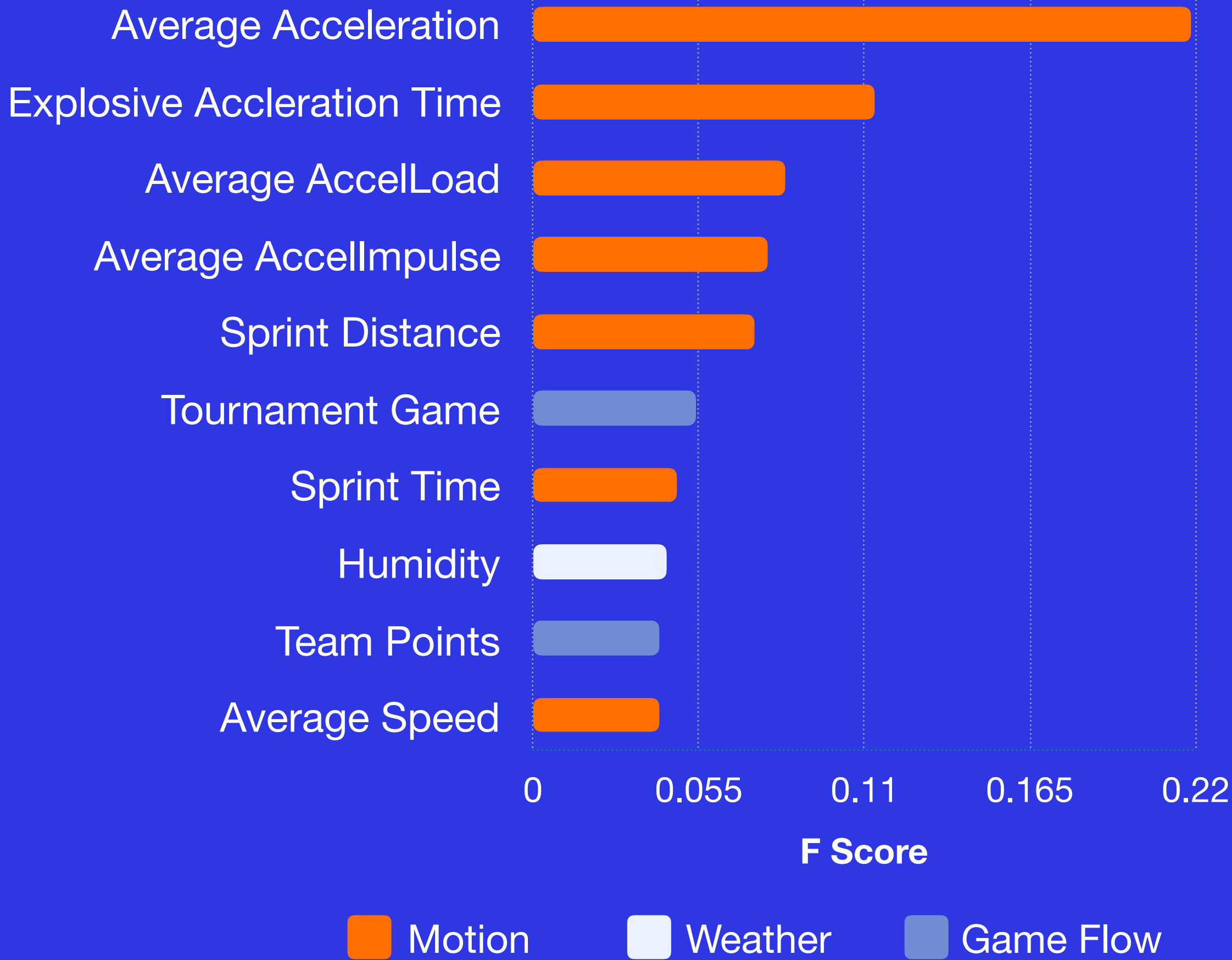
# AUC Scores

Predicting holistic fatigue categories

|            | Fatigue | Soreness | Irritability | Sleep | Desire | Monitor |
|------------|---------|----------|--------------|-------|--------|---------|
| Subjective | 0.48    | 0.58     | 0.54         | 0.47  | 0.47   | 0.50    |
| Combined   | 0.52    | 0.55     | 0.55         | 0.57  | 0.73   | 0.66    |
| Objective  | 0.65    | 0.62     | 0.54         | 0.60  | 0.7    | 0.71    |

# Top Feature Importance

Monitoring Score Prediction w/Game Features



# Recommendations

- Integrate objective game measures and use model to monitor player fatigue.
- Identify high-fatigue players and modify their load.
- Combine subjective and objective features to adjust training and game-load.

## Next Steps

Include Historical Data

Personalized Model  
on Individual Basis

Collect Data in Training

Improve  
Monitoring Score