Identifying PED Use Amongst Olympic Athletes

Purpose

Build a model that will identify Performance Enhancing Drug use to provide the International Olympic Committee with an expedient tool aiding in the identification of athlete samples to re-test.

- Guilty athletes being retroactively stripped of their ranking with ban/suspension.
- Improve clean athlete rankings

Process

- Exploratory Data Analysis
- Data Preprocessing
- Feature Engineering
- Modeling
- Model Evaluation
- Model iterations
- Deployment

Data

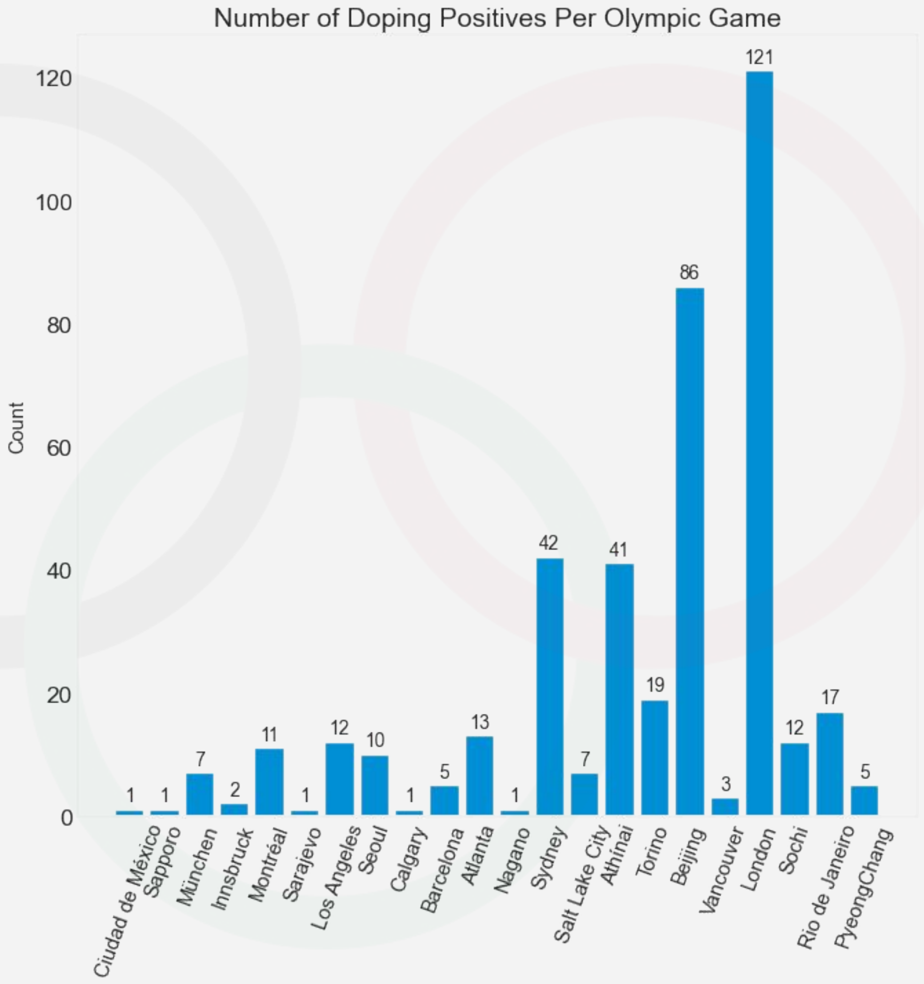
- Olympedia
- Olympic
- Kaggle Datasets
- World Anti-Doping Agency (WADA)
- Wikipedia

(2004-2016 data obtained)

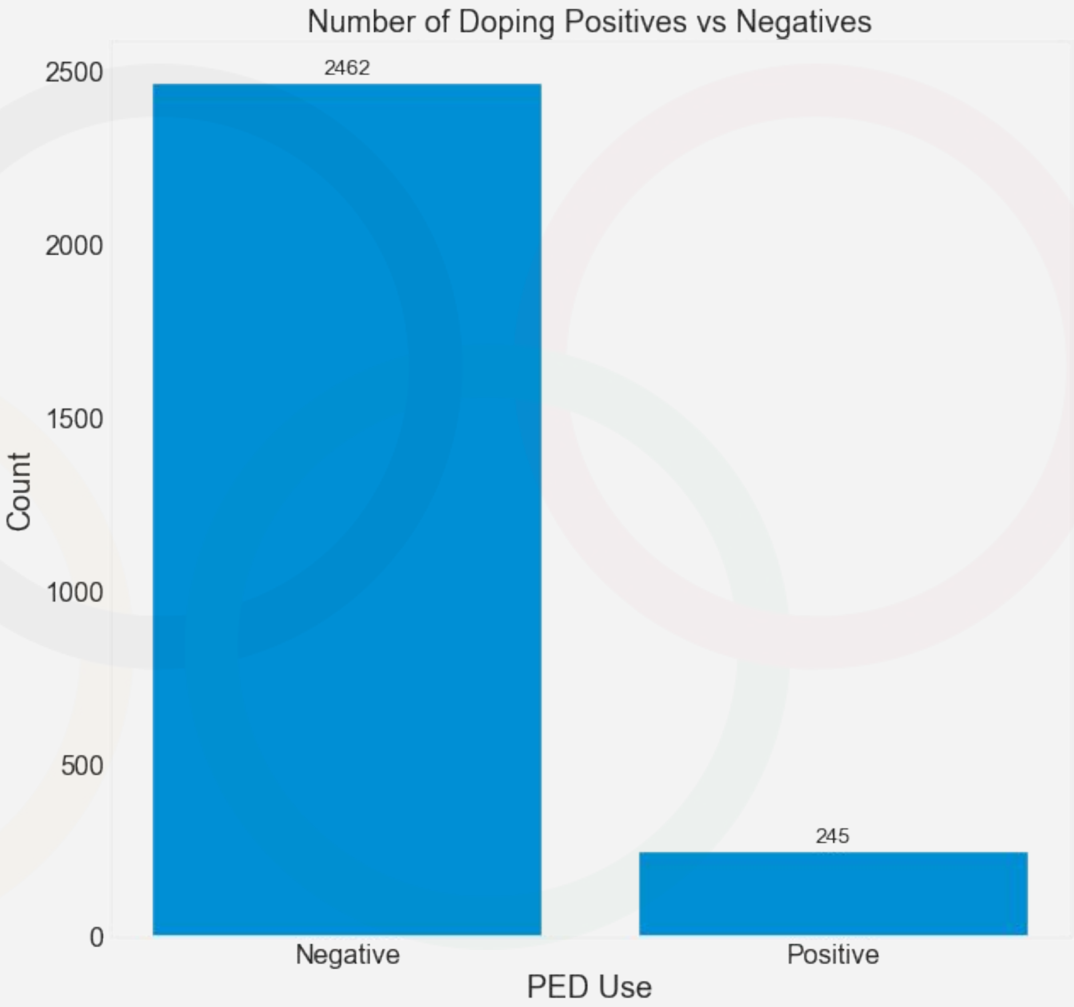
Combined multiple data sources together with added feature indicated positive or negative PED use

Exploratory Findings

Doping Positives per Olympic Games



Limitations



Baseline Model

Scikit-Learn Dummy Classifier

- Optimizing for recall to limit False Negatives

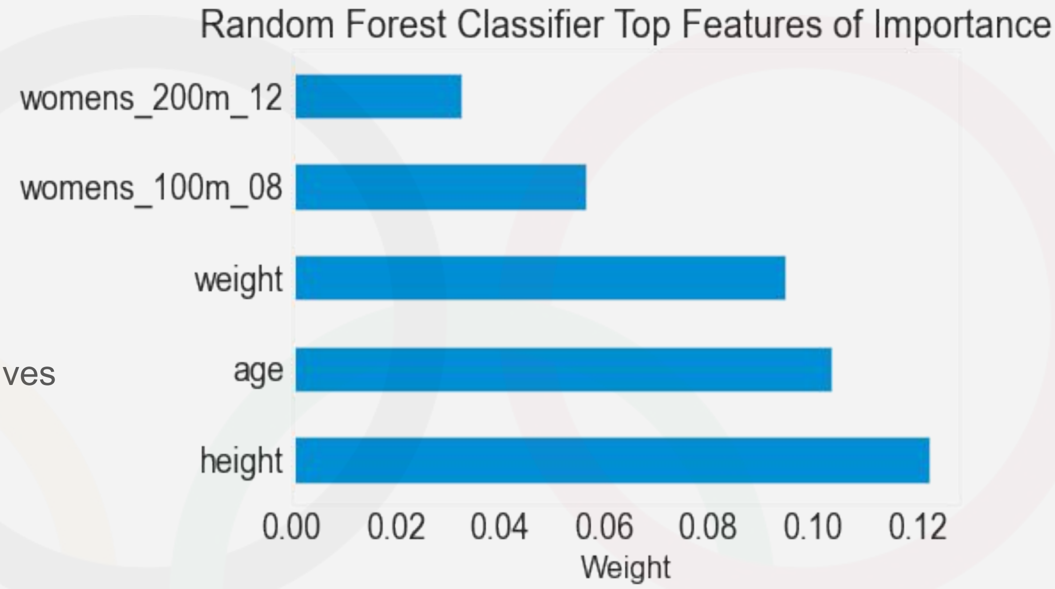
The higher the AUC score, the better the model is at distinguishing positive vs negative PED use.

Recall	**9%**
Precision	6%
Accuracy	81%
ROC-AUC	50.53%

Best Model

Random Forest Classifier

- Optimizing for recall to limit False Negatives



Parameters:

- Random Undersampling the majority class

Recall	**75%**
Precision	32%
Accuracy	83%
ROC-AUC	80%

Next Steps

- Include event results from other Olympic Sports
- Improve upon class imbalance before deployment
- Create feature indicating difference in event results from previous year’s Olympic Games
- Neural Network classification modeling
- Model evaluation on next Olympic Games event results

Thank You

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