



# Batting For Dollars

Eric Kleinschmidt  
July 20, 2018



# Batting Performance vs. Salary



## Average Annual Batting Performance 2015 - 2017 - No Pitchers

### 10 Features

R - Runs Scored  
H - Hits (H)  
RBI - Runs Batted In  
BB - Bases on Balls / Walks  
SO - Strikeouts  
GDP - Double Plays Grounded Into  
HBP - Times Hit By Pitch  
SH - Sacrifice Hits (Sacrifice Bunts)  
SF - Sacrifice Flies  
IBB - Intentional Bases on Balls

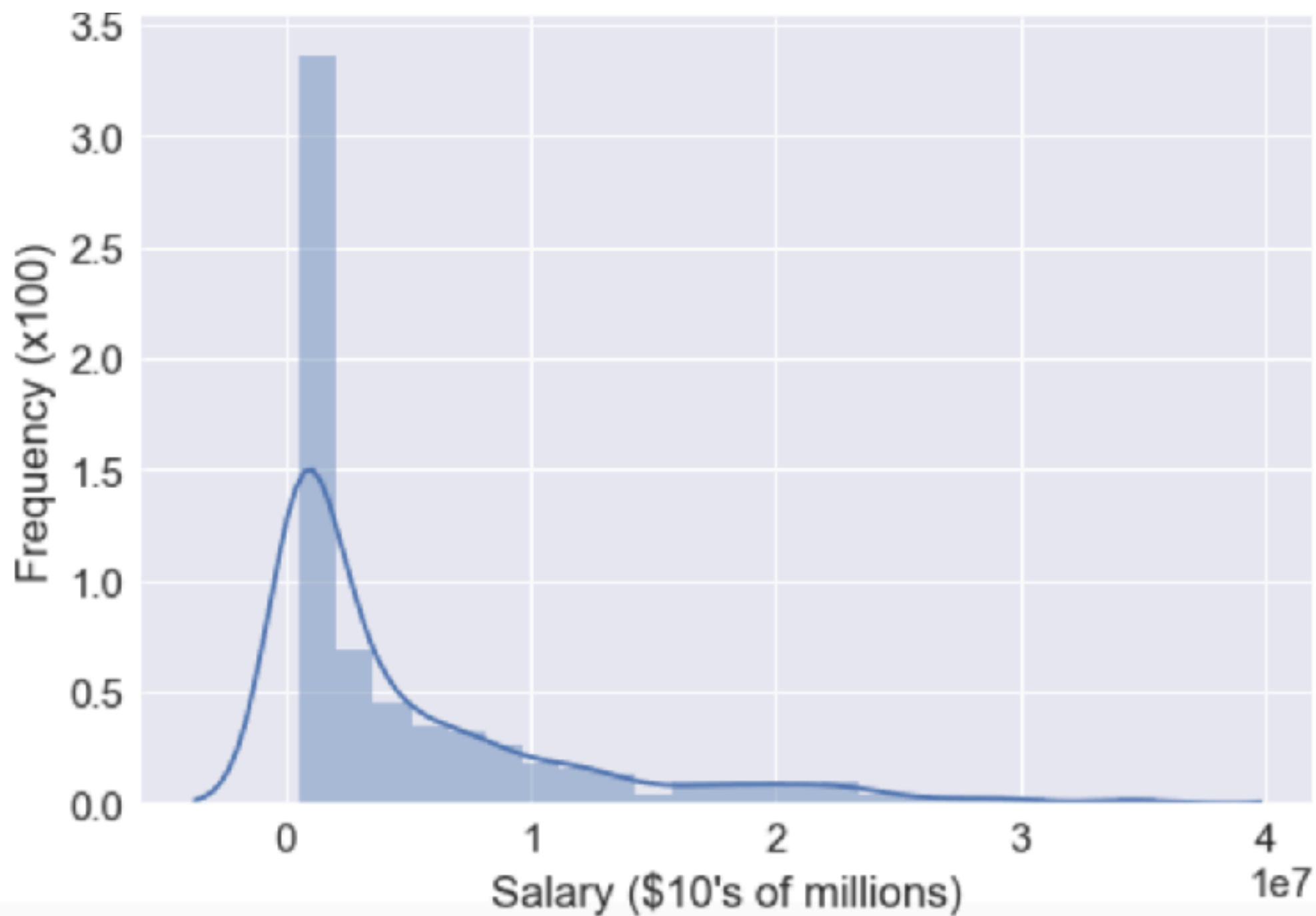


## 2018 Annual Salary

### Target



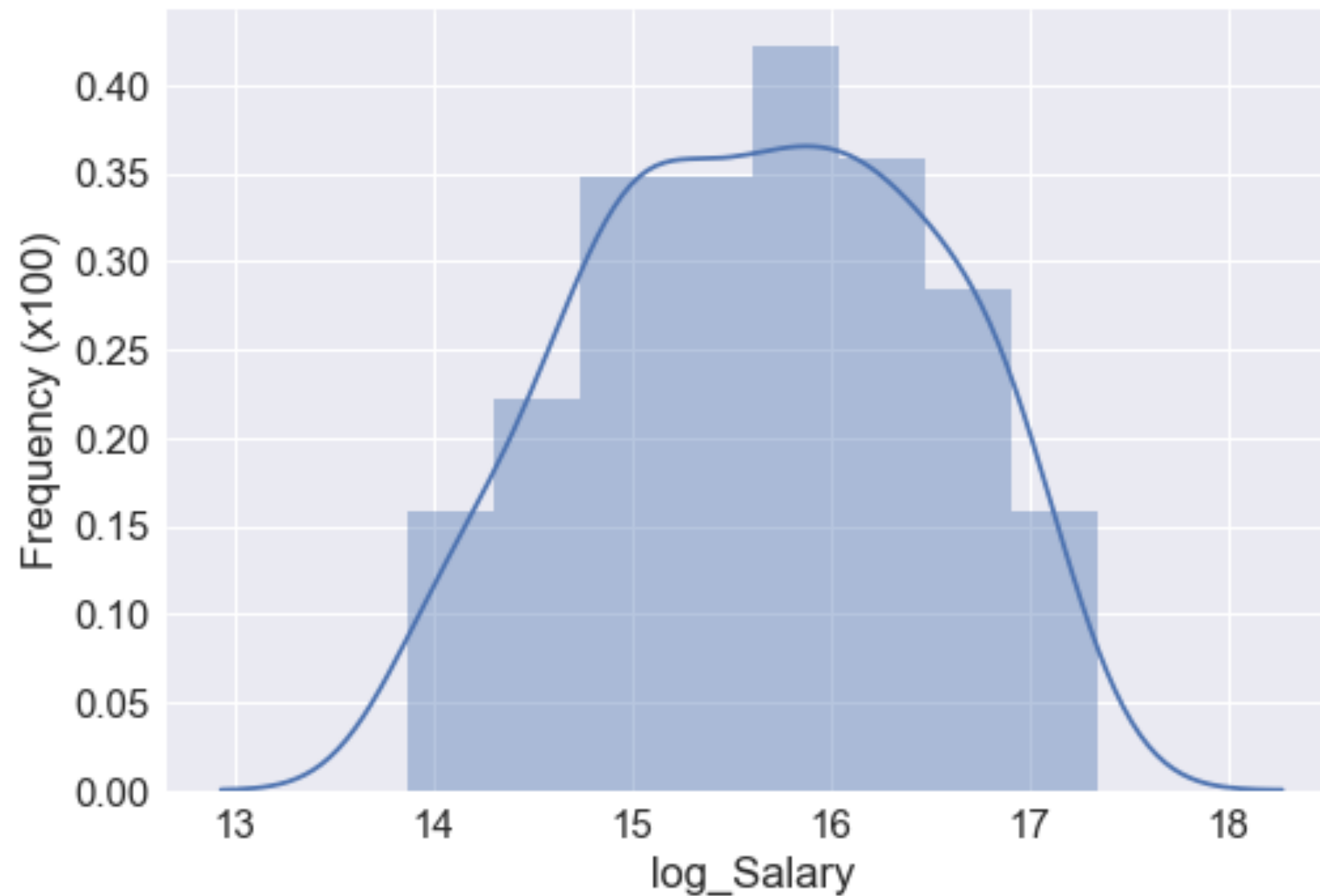
# Target ('Salary') Distribution



361 Players

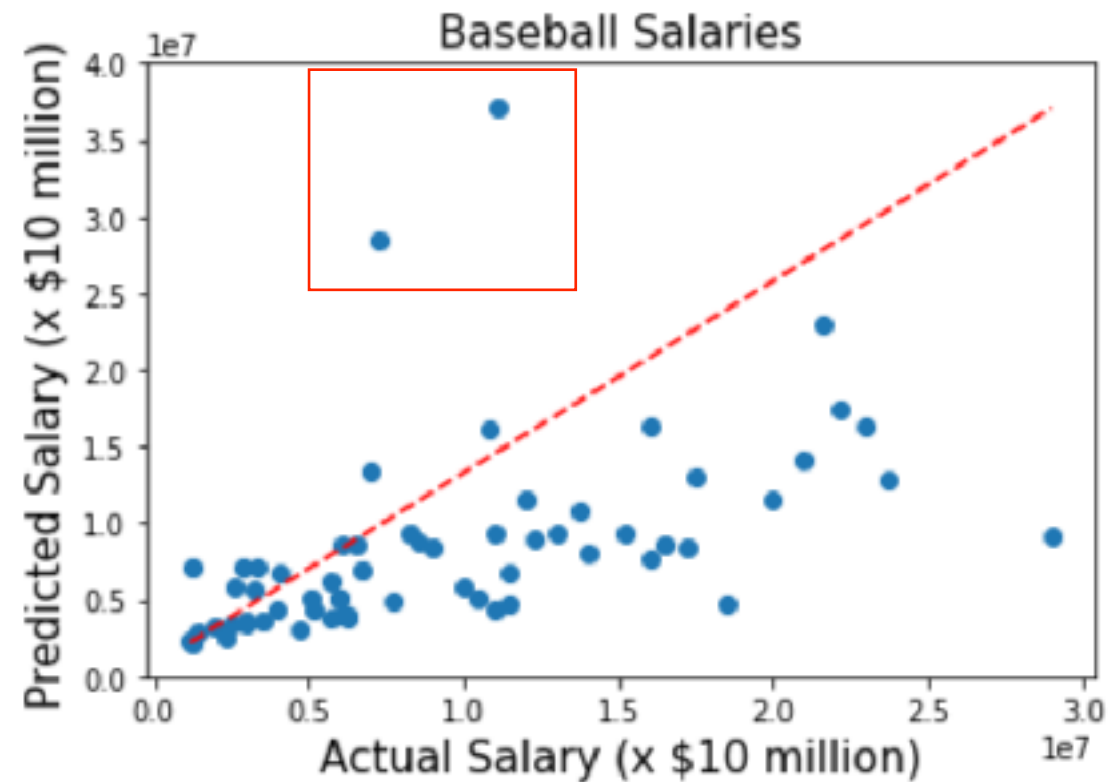
# Target ('Salary') Distribution

- Log Transformed Target ('Salary')
- Dropped players with < 75 plate appearances
- Dropped players with < \$1 million salary



**206 Players**

# Model



Mean Absolute Error = \$4.3 million



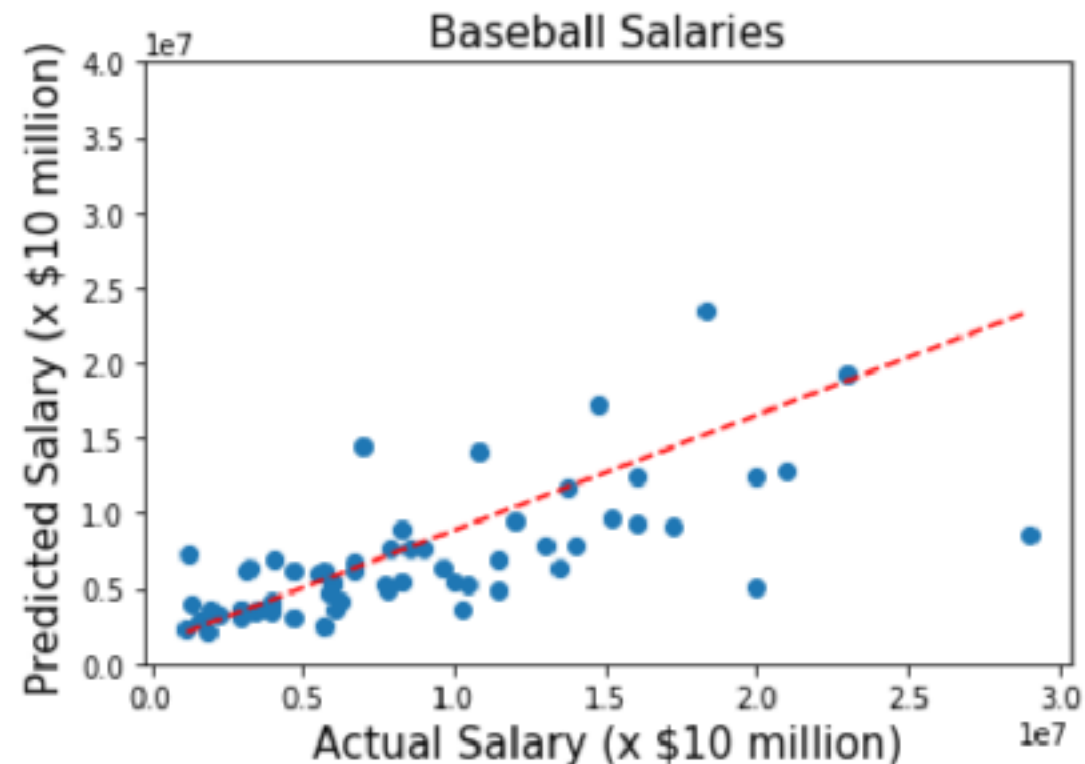
Removed:

**Paul Goldschmidt**

- First Year 2011
- 2018 Final Year Five Year Contract

**Anthony Rizzo**

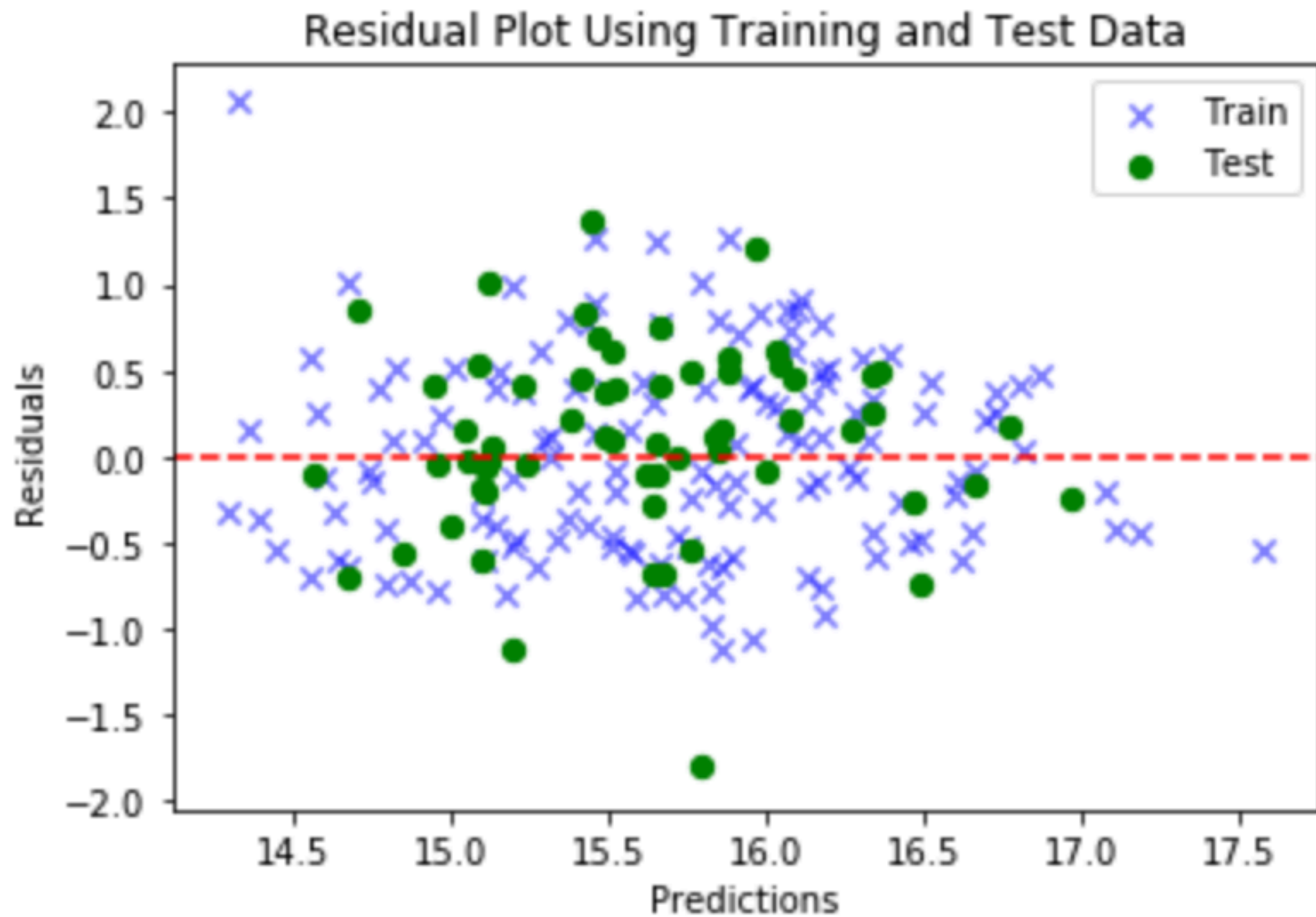
- First Year 2011
- 2019 Final Year Seven Year Contract



Mean Absolute Error = \$3.3 million

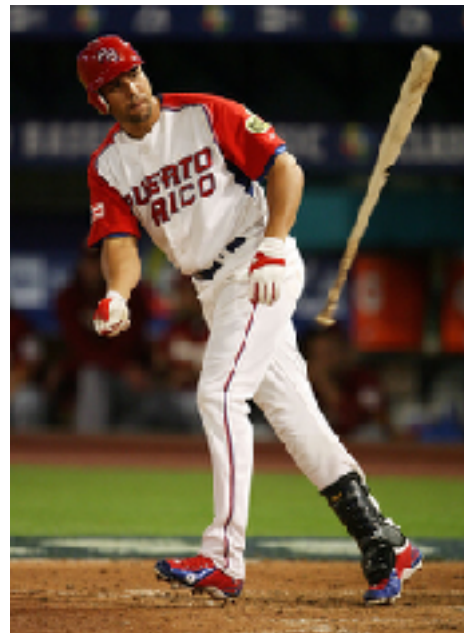


# Model Fit



# Model Interpretation

Features	Coefficients
Walks	0.235
Ground Into Double Play	0.173
Runs Batted In	0.169
Hits	0.126
Runs Scored	0.056
Intentional Walks	0.032
Sacrifice Flies	0.007
Hit By Pitch	-0.011
Strike Outs	-0.048
Sacrifice Bunts	-0.093



## Get on Base

-You don't need the bat



## Hit the Ball

-On the ground is good

# Lasso Regularization

- Put in all available year by year features (58 features)
- Grid search on penalty weight (“alpha”) - choose optimum
- Improved mean squared error to \$3.0 million
- Chose 12 coefficients pushing 46 to zero

Features	Features
Walks 2016	0.173
Runs Batted In 2015	0.111
Hits 2017	0.080
Intentional Walks 2015	0.073
Hits 2015	0.071
Sacrifice Flies 2015	0.063
Runs Batted In 2016	0.055
Runs Batted In 2017	0.039
Ground Into Double Play 2015	0.019
Ground Into Double Play 2016	0.018
Runs Scored 2015	0.013
Ground Into Double Play 2017	0.008



# Next Steps

- Consider fielding and running



- What about pitchers?

