Project Luther:

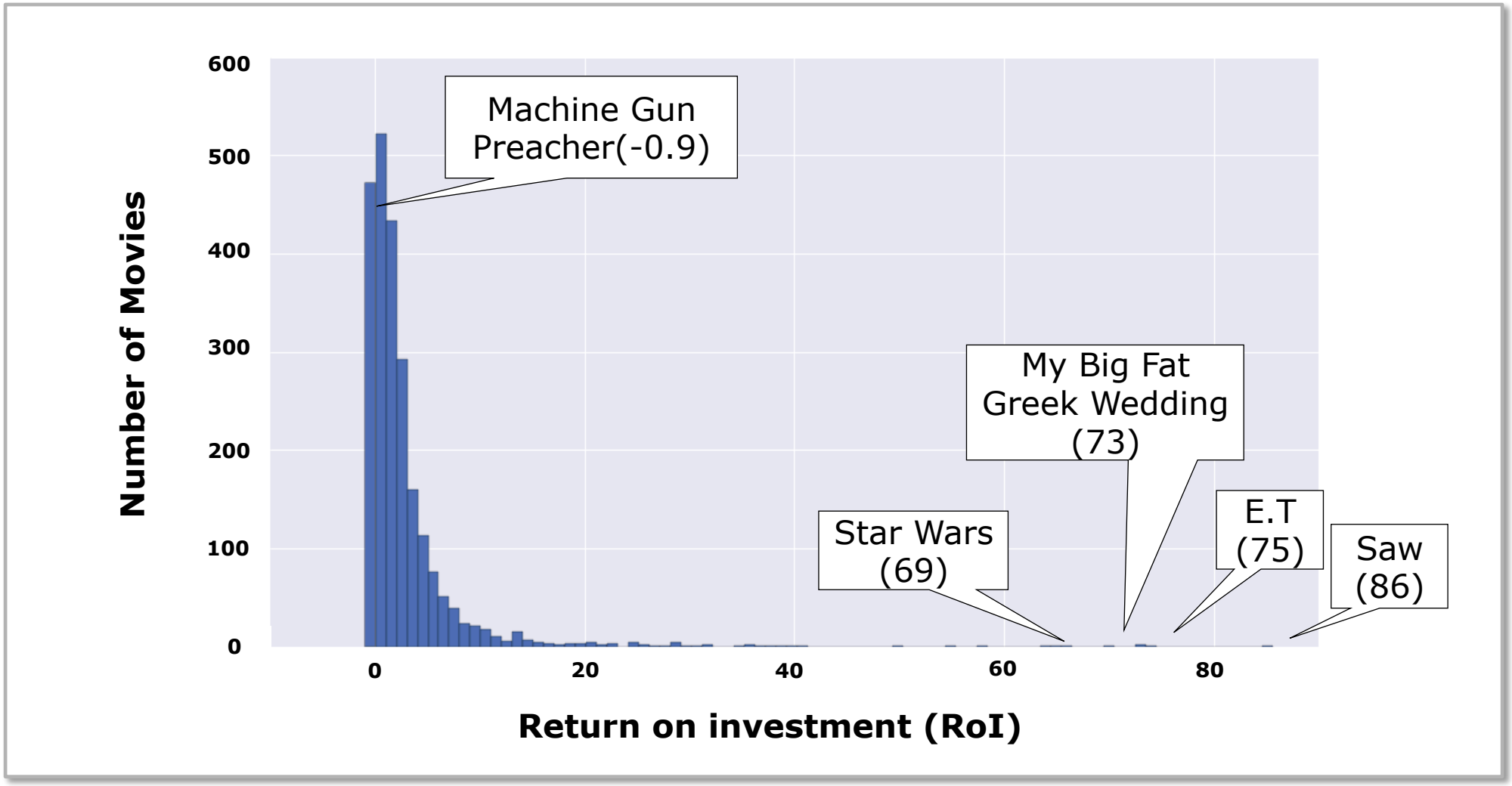
Predicting Return on Investment of Movies

San Francisco, 10/07/2016, Herr Nils

Goal: Predict Return on investment before the movie is produced

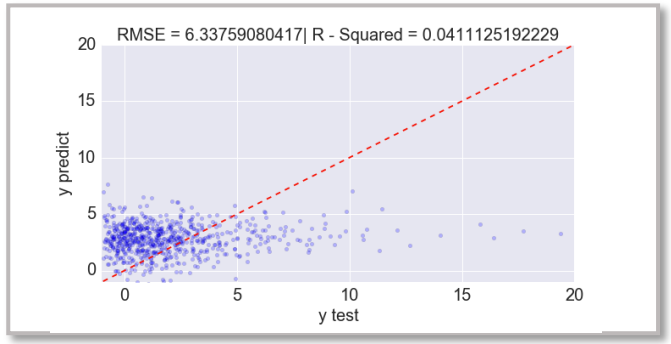
1 Target	**Return on investment (RoI)** := $\frac{Worldwide\ adjusted\ Gross - adj.\ Budget}{Adjusted\ Budget}$
10 Features	Budget (adjusted) · Runtime · Genre · Reputation of Actors · Reputation of Director True story? · Book Adaption? · MTAA Rating · Season · 3D enabled?
2400 Movies	2400 Movies scraped using three sources: Box Office Mojo, IMDb and goodread.com

Overview: RoI varies between -1 and ~86 between movies



Result: Random forest model with R^2 of 0.26 is more accurate than Linear Regressions

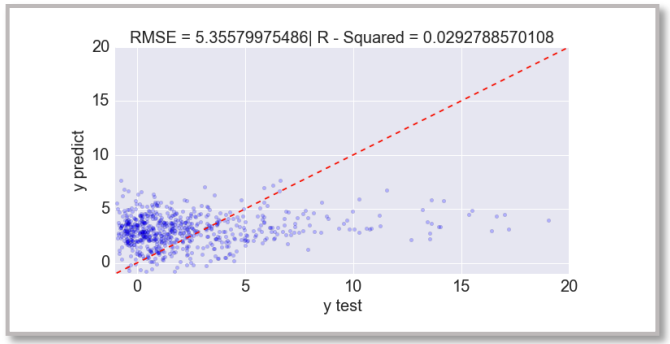
Standard Linear Regression



- **Highest correlations:**
  - **Adj. Budget:** -0.14
  - **Action/ Adventure:** -0.07
  - **Rat-PG-14: -0.6**
  - **Actors` Reputation:** 0.05

R^2: 0.04

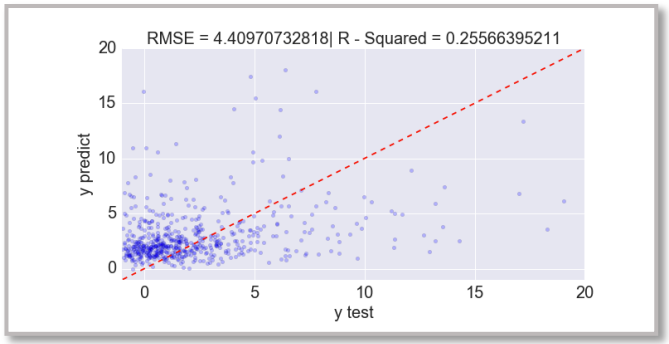
Lasso Regression



- **Highest correlations:**
  - See Standard linear regression

R^2: 0.03

Random Forest

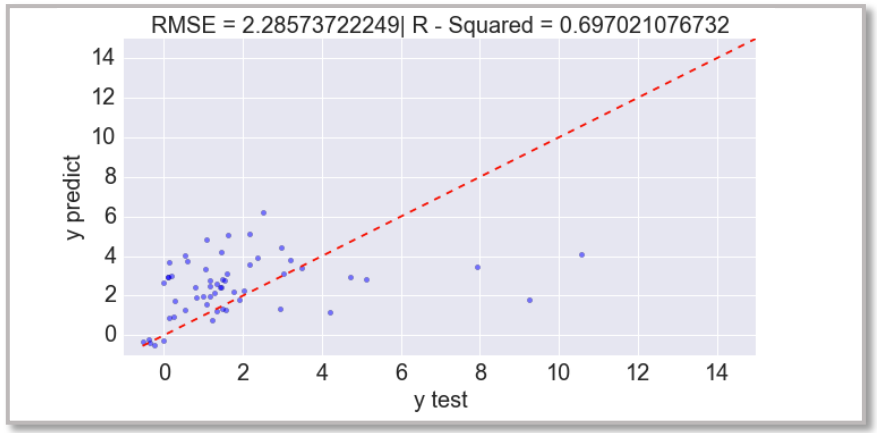


- **Most relevant features:**
  - **Adjusted Budget**
  - **Runtime**
  - **Actors` Reputation**

R^2: 0.26

Major accuracy improvement when looking within selected Genres only

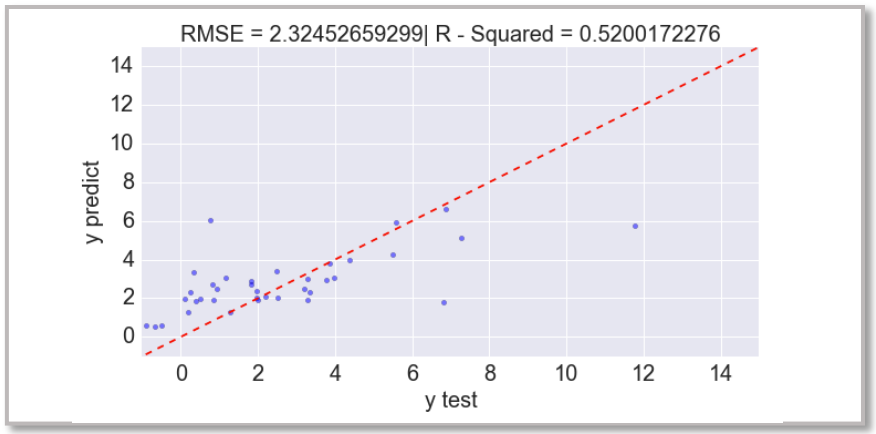
Sci-Fi/ Fantasy Movies only (Random Forest)



- **Random Forest Model for Sci-Fi/ Fantasy movies**
- **228 movies in dataset**

R^2: 0.70

Animation Movies only (Random Forest Model)



- **Random Forest Model for Animation Movies**
- **149 respective movies in dataset**

R^2: 0.52

Potential Next steps

- Examine additional subsets – e.g.
  - Different rating categories
  - 3D movies only
  - …
- Consider further regression models