Delving into Corsi: Building predictors for shot attempts in hockey

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Motivation

A player's Corsi-for percentage in hockey is a measure of how many shots his team attempts while he is on the ice:

$$CF\%(X) = \frac{\text{shot attempts for X's team while X on-ice}}{\text{shot attempts for both team while X on-ice}}$$

Note: Shot-attempt = shot on goal OR shot missed / blocked

Questions:

- Can we predict shot-attempts using the *CF%* statistic?
- Can we build a *better* predictor, using all shot attempt data?
- Most importantly: is the *CF%* a good measure of how a player influences shot attempts?

Our Data Set

Main data set:

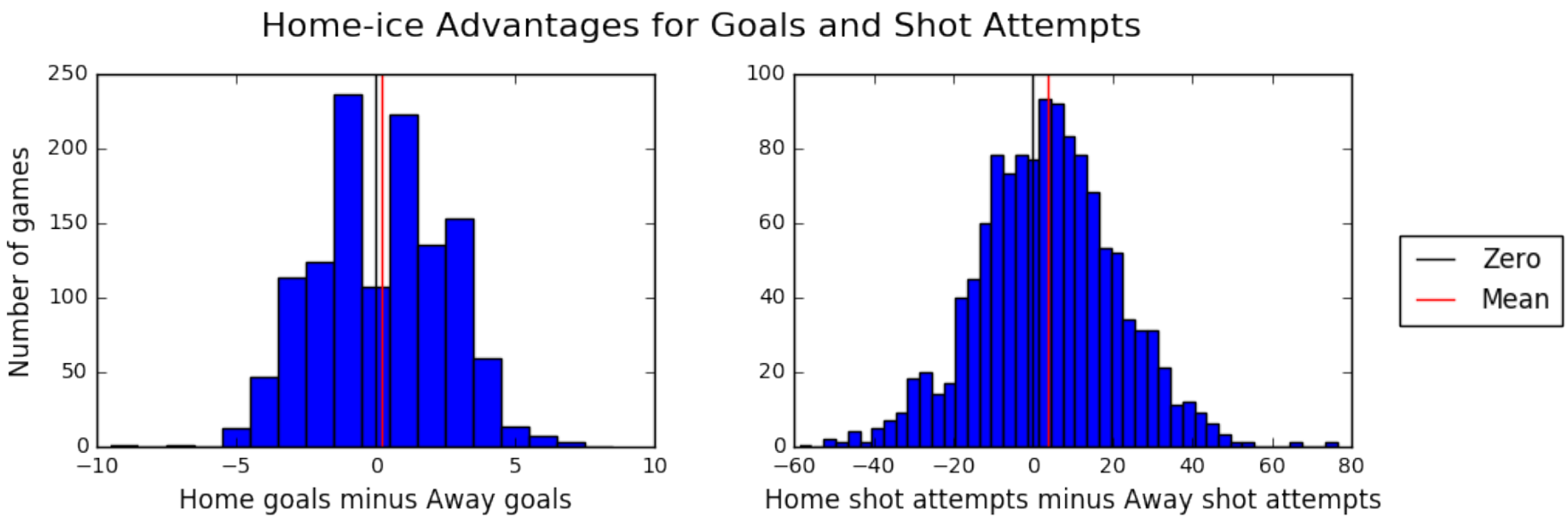
- All 1,230 regular-season games in the 2015-2016 NHL season
- 136,540 shot attempts (of which 66,601 were on goal, and 6,565 were goals)
- 900 players (no goalies). Player on home-ice treated differently then on away-ice (home-ice advantage is real!)

Additional data:

- Salaries of all players
- Average time-on-ice per game for all players

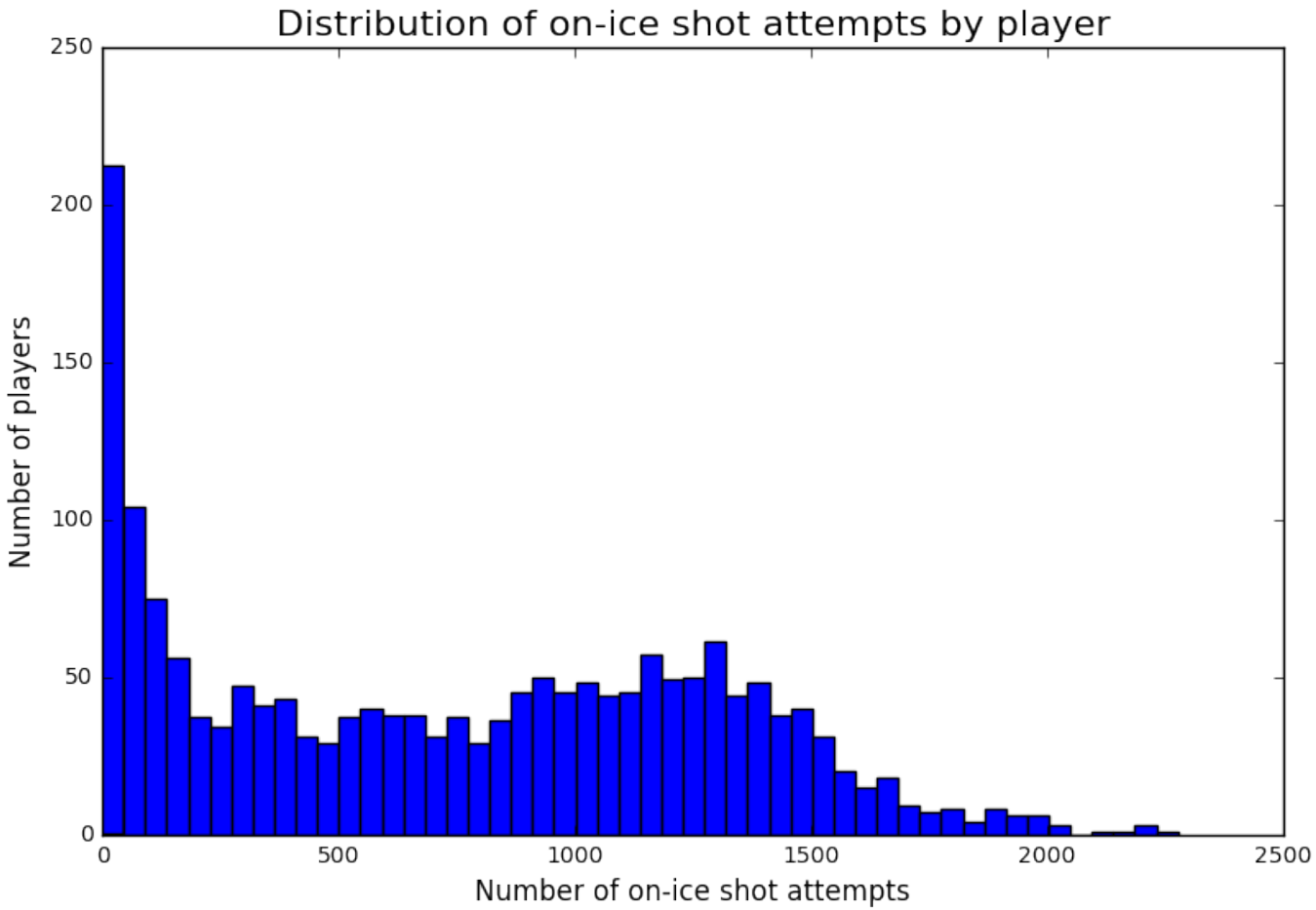
Home-ice advantage

Home-ice advantage is worth on average 0.198 goals/game, and 3.582 shot attempts/game.



Distribution of Shot-attempts

Studying shot-attempts instead of shots on goal gives us bigger sample size.



Predictors

We want to build a shot-attempt predictor, based on data from the 2015-2016 NHL season. There were 136,500 attempted shots in this season, and a total of 900 players (excluding goalies). We built three different algorithms, using three different

1. A logistic regressor using only six features: the cumulative $CF\%$ of home and away players, the average salaries, and the average playing time.
2. A logistic regressor using individual 1,800 binary features. Each player has two features: whether he is on-ice at home, or away.
3. A random forest algorithm using the 1above,800 features.

Crude Logistic Regressor

Sensitive Logistic Regressor

Random Forest Predictor

Findings