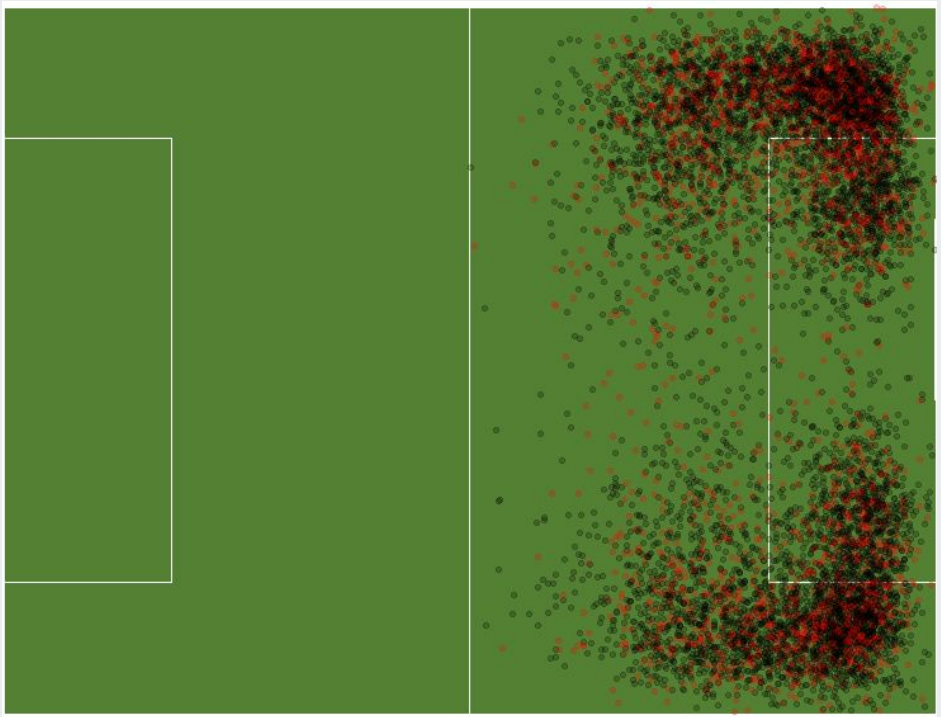
Golden Players: Perfect Crosses

Daniel Daly-Grafstein, Nate Sandholtz, Kevin Floyd, Nikola Surjanovic



Research Question

Can we estimate player crossing skill?

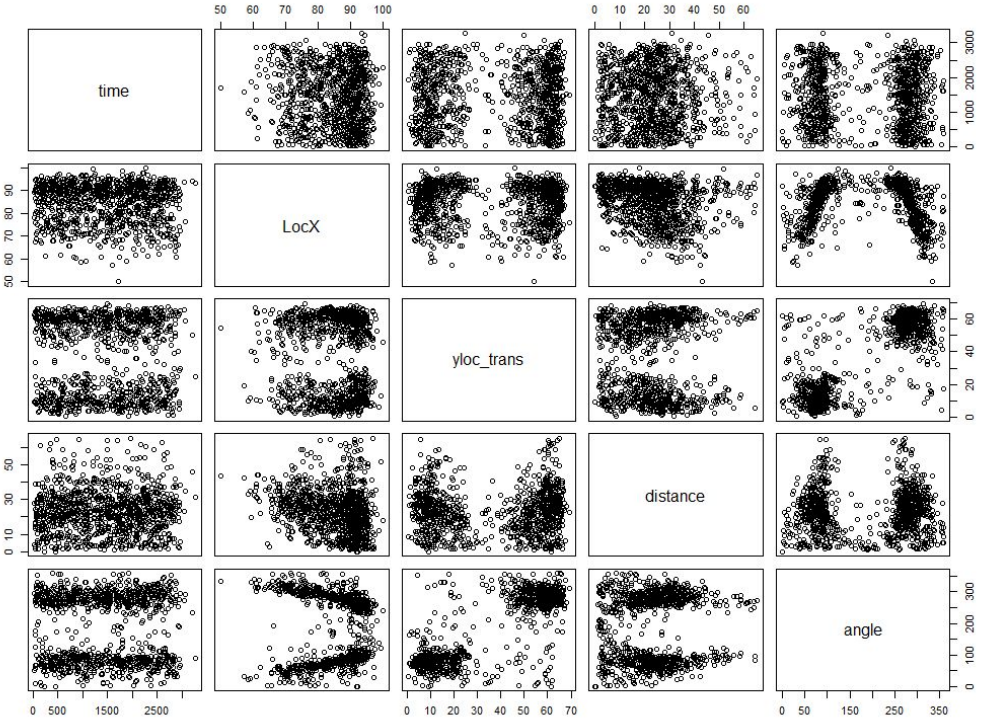
Data Exploration

9895 attempted crosses in 2017 season

2333 completed (24% completion rate)

11% of completed crosses led to goals

Data Exploration



Model

$$p(Y_n = 1|\mathbf{\Theta}) = \sigma\left(\theta_{mean} + \beta_{p_i} + \sum_{j}^{4} \beta_j x_{nj}\right)$$

$$\beta_{p_i} \sim \mathrm{N}(\beta_{g_i o}, \sigma_p^2)$$

$$\beta_{g_i} \sim \mathrm{N}(0, \sigma_g^2)$$

where β_1, β_2, β_3, β_4 refer to discrete location, distance from goal, angle, and angle squared respectively

Model Validation

Model	Misclassification Rate	Brier Score	Log Loss
Grand Mean Model	NA	0.180	0.546
Player Mean Model	0.481	0.191	NA
Empirical Bayes Model	0.478	0.178	0.547
Full Hierarchical Model	0.482	0.176	0.535

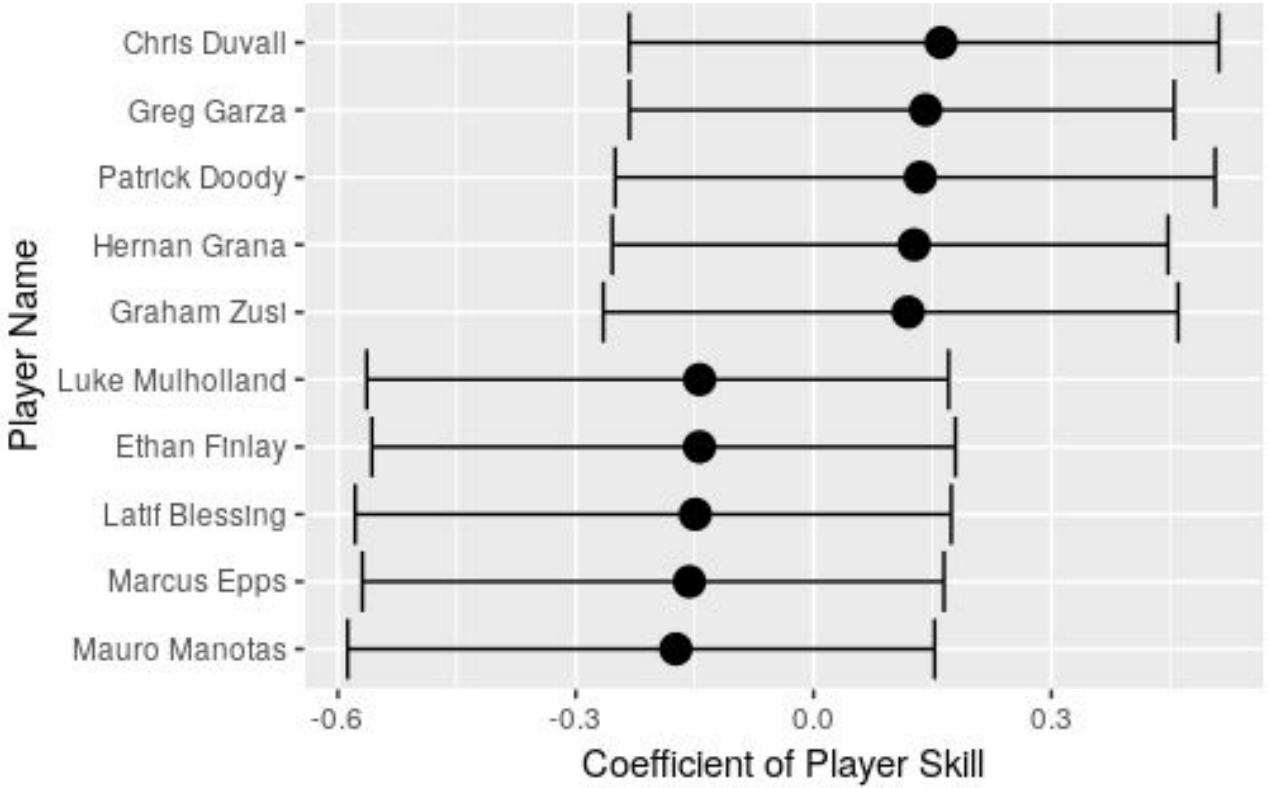
Good Crossers

Player	Change in Log Odds (Increase)	Change in Probability (at p=0.24)
1. Chris Duvall	0.16	3.1%
2. Greg Garza	0.14	2.7%
3. Patrick Doody	0.13	2.5%
4. Hernan Grana	0.13	2.4%
5. Graham Zusl	0.12	2.2%

Bad Crossers

Player	Change in Log Odds (Decrease)	Change in Probability (at p=0.24)
458. Mauro Manotas	-0.17	-3.0%
457. Marcus Epps	-0.16	-2.7%
456. Latif Blessing	-0.15	-2.6%
455. Ethan Finlay	-0.14	-2.5%
454. Luke Mulholland	-0.14	-2.5%

Best/Worst Crossers



Remarks