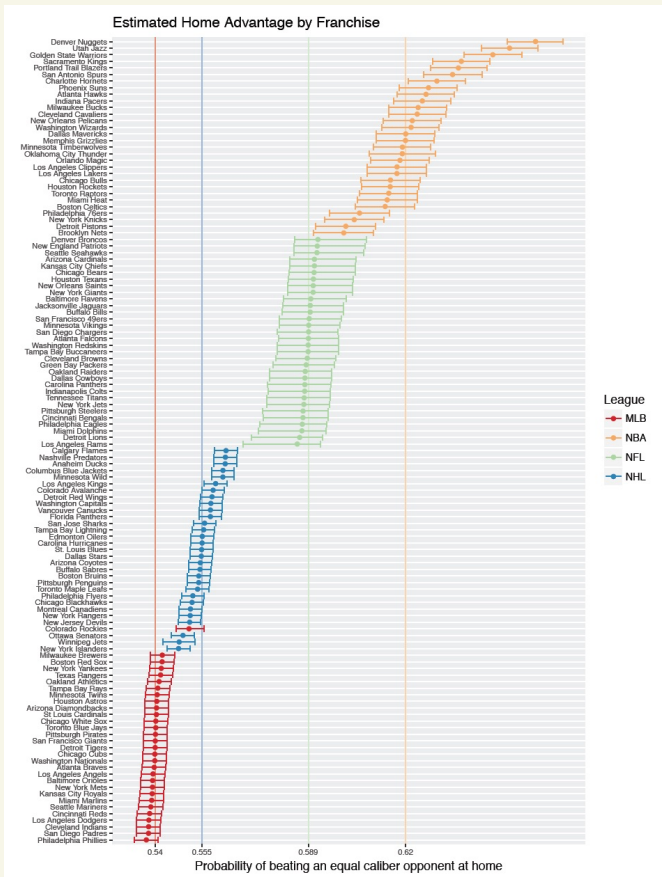


Lab: Fully Bayesian Modeling

1. Comparing Home Field Advantages Across Sports

Your task is to fit a fully Bayesian Model that will elucidate differences in home field advantage across NFL teams. The goal is to Re-create the following plot (due to Michael Lopez) for the NFL teams.



It is essential to adjust for team strength. Modify the model from today's lecture to fit team-varying home field advantage parameters.

Write the model and fit it in Stan.

A description of how to do this is given on the next page but try not to look at first.

- Modify the power rating model from class today to include Home Field advantage params varying by team,

$$\begin{cases} \alpha_j & = \text{home field advantage parameter for team } j \\ \alpha & = \text{overall home field advantage parameter} \end{cases}$$

with distributions

$$\begin{cases} \alpha_j & \sim \mathcal{N}(\alpha, \sigma_{\text{HFA}}^2) \\ \alpha & \sim \mathcal{N}(0, \tau_{\text{HFA}}^2) \\ \sigma_{\text{HFA}}^2, \tau_{\text{HFA}}^2 & \sim \mathcal{N}_+(0, 5^2) \end{cases}$$