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Kickers Model for Broncos Application

In my application, I explained a classic state-space model that I had done before. But I found out that the state-space models I have done before do not perform well when the observed state is binary instead of continuous. So I opted for a Bayesian Hierarchical State-Space Model.

Possible Improvements and Next Steps:

- The model does not have a sense of when one kicker's kick took place relative to another kicker's kick. Therefore, it doesn't make sense to use the model with both active players and players who have been inactive for a considerable amount of time. To solve this issue, I could figure out a way to adjust the ratings to account for the uncertainty and possible dropoff in performance of a player who has been inactive for a while. This could be done by either changing the distribution of the latent states within the model, or adjusting the ratings after the model has run.
- Variables such as wind speed, wind direction relative to the kick direction, and temperature would be useful covariates to include in the observed equation.
- The convergence of the MCMC chains has been an issue particularly with the prior variance of the latent states (tau_alpha in the model). While I don't believe the value of this variable has much of an impact on the model's estimated abilities of the kickers, it would be useful to take the time to understand the convergence issues and how to fix them.

I do not know of any other models that I would prefer in this scenario. I would take the time to better understand this model since it is the first time I've used it. I have done State Space models, Hierarchical models, and plenty of Bayesian models in R. But this is the first time I've used a Bayesian Hierarchical State Space model. If I end up landing this job, I will certainly learn more about this method since it seems very useful for player analysis.