

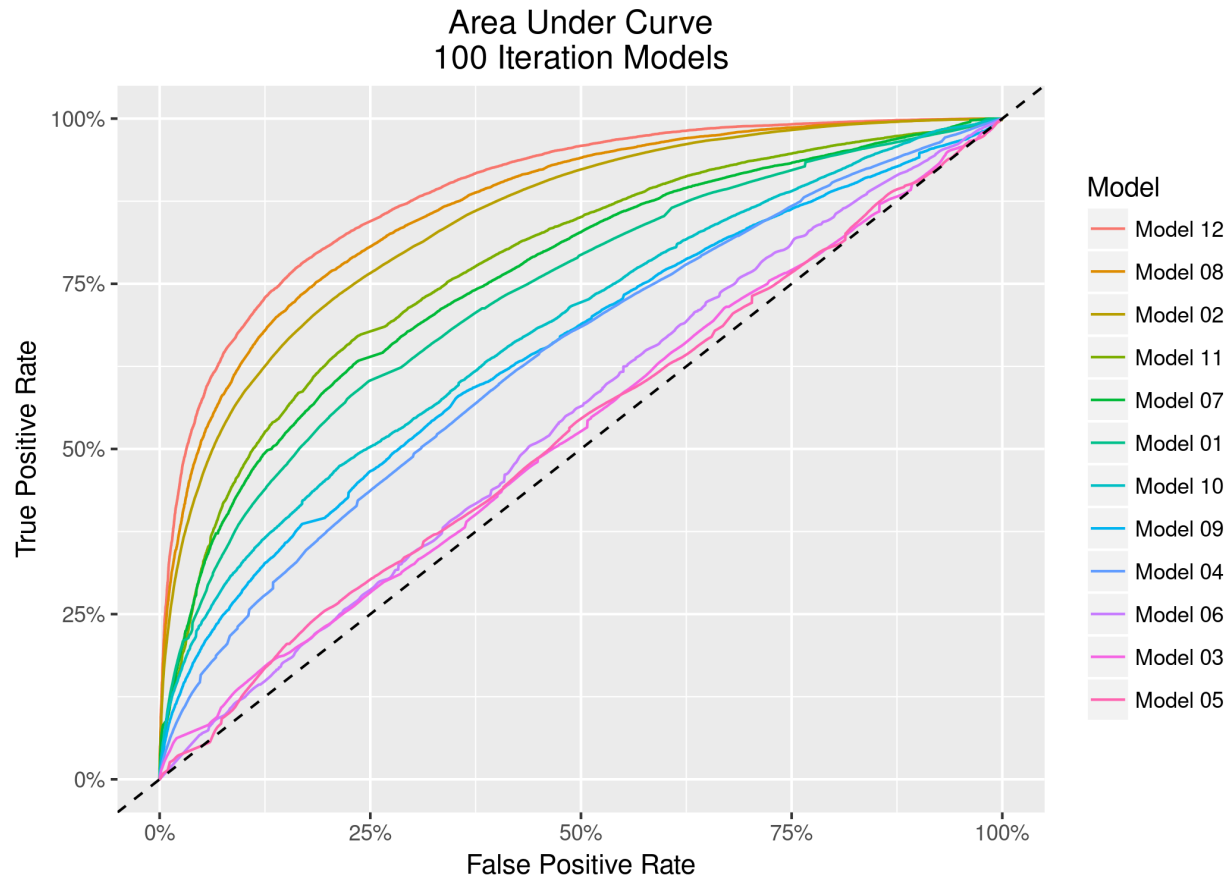
# Response to Feedback

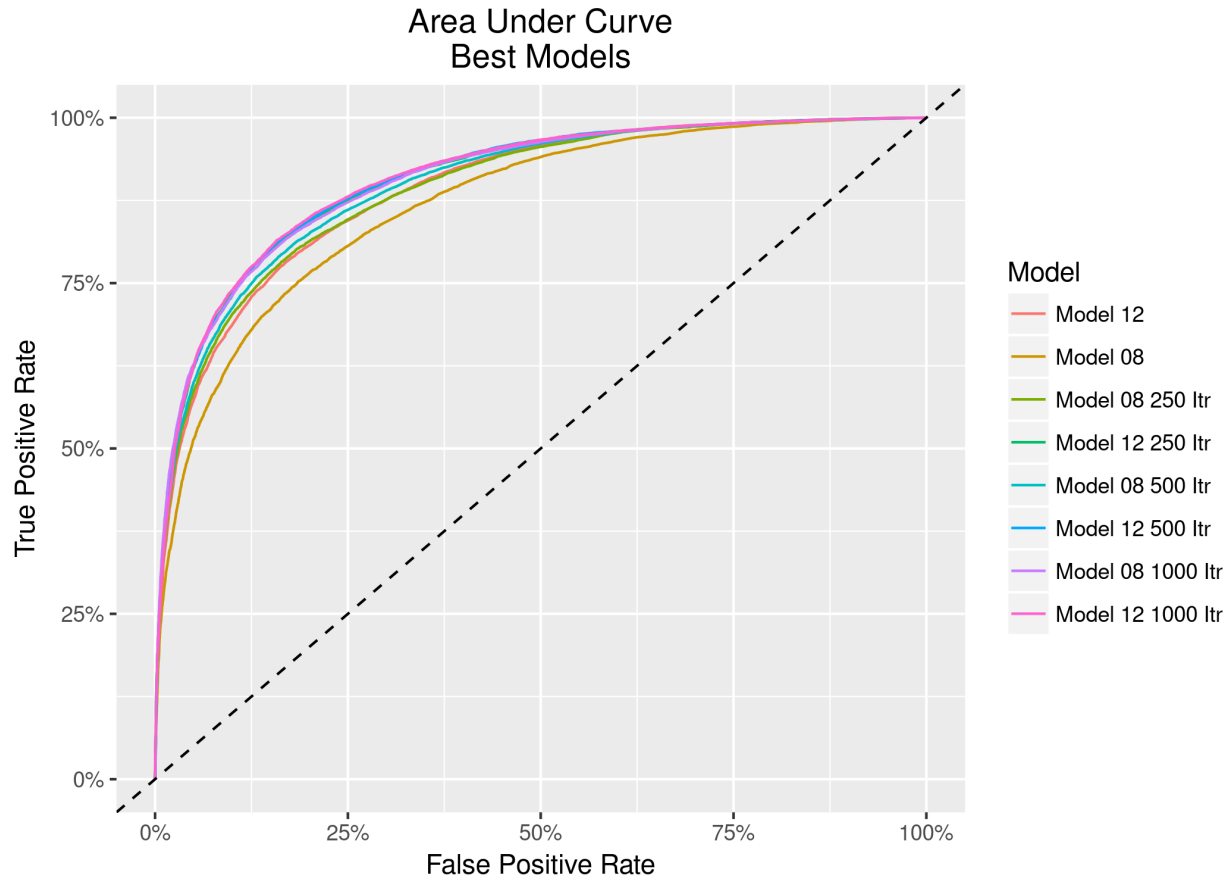
*Joseph Blubaugh*

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**Why not use ROC curves to graphically compare model performance?**

I did not think about this at all, but I think its a great idea.





#### Model Performance

Model	Data Processing	Data Split	MaxItr	Size	Decay	Training	Testing	AUC
Model 1:	Original	365 Split	100	50	.20	.760	.676	.734
Model 2:	Original	Entire Sim	100	50	.20	.754	.754	.847
Model 3:	Differencing	365 Split	100	10	.00	.518	.516	.526
Model 4:	Differencing	Entire Sim	100	25	.10	.572	.571	.637
Model 5:	Moving Avg	365 Split	100	10	.00	.503	.502	.527
Model 6:	Moving Avg	Entire Sim	100	10	.00	.528	.528	.544
Model 7:	1/2 Sec Cut	365 Split	100	50	.10	.820	.698	.761
Model 8:	1/2 Sec Cut	Entire Sim	100	50	.20	.788	.779	.868
Model 9:	1/2 Sec Diff	365 Split	100	50	.10	.633	.602	.650
Model 10:	1/2 Sec Diff	Entire Sim	100	50	.20	.682	.622	.681
Model 11:	1/2 Sec Cut Stat	365 Split	100	50	.10	.846	.716	.781
Model 12:	1/2 Sec Cut Stat	Entire Sim	100	50	.20	.820	.803	.891

### Further Training Best Models

Model	Data Processing	Data Split	MaxItr	Size	Decay	Training	Testing	AUC
Model 8:	1/2 Sec Cut	Entire Sim	250	50	.10	.816	.804	.893
Model 8:	1/2 Sec Cut	Entire Sim	500	50	.10	.828	.810	.899
Model 8:	1/2 Sec Cut	Entire Sim	1000	50	.10	.842	.820	.906
Model 12:	1/2 Sec Cut Stat	Entire Sim	250	50	.10	.858	.823	.906
Model 12:	1/2 Sec Cut Stat	Entire Sim	500	50	.20	.864	.823	.907
Model 12:	1/2 Sec Cut Stat	Entire Sim	1000	50	.10	.871	.824	.908

**Are you trying to detect whether texting occurred during a given interval or a single observation?**

Initially I was looking at individual observations, but as I tried different approaches I ended up aggregating the data and found those models to be the best performing.

**Baselining: What is the purpose?**

My goal was to remove the effect of the simulation from the texting trial. The simulations involved active traffic and a detour which each driver had to navigate. Since trial 4 was identical to trials 5, 6, and 7 minus the events that took place, it seemed like the natural choice.

**Why do you say there was evidence that one size fits all model will not work?**

At this stage I was aggregating data at the subject level by event and I think the range of values were all over the place which prevented the models I tried from being any good. I proposed that adding a factor variable for subject would allow me to model individuals driving behavior that might be more successful at detecting texting.

**On Time omission – why not include lagged variables?**

In retrospect this probably would have been a good thing to try. The farthest I went looking into time series was trying differencing which ended up being the worst of all of the methods I experimented with.

**Does including age and gender as well as Subject in the model cause problems due to collinearity?**

I mainly included age and gender so that there were parameters available to account for universal age and gender effects, if there were any. I don't think there is an issue with collinearity because I'm not inferring anything about the weights (coefficients).

### **Exmplain (sens+spec)/2**

I presented this in a more complicated way than was neccessary. It turns out that the formula is equivalent to the "total percentage correct". I initially set it up that way incase I wanted to penalize false positives or negatives more. I had a multivariate course last year that did this. I never ended up doing that so I will eliminate that metric and just represent it as percentage correct.

### **Why move 60/40 to 50/50?**

Only because the initial aggregate data I created had very few observations so I was just trying to have more data to train on. There was no real scientific reason for this. I may cut this exploratory section out entirely.

### **Less on interpreting nnet weights**

Agreed. I have pretty much concluded that trying to extract and interpret weights on large nuerl nets is very tricky and not very helpful.

### **Reduce or cut material on initial analysis and aggregated data?**

Agreed.