Final Project Grading

Name of student

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Student ID

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Readability *

	1	2	3	4	5	
Narrative unclear and/or difficult to read	○	○	◉	○	○	Narrative very clear and/or easy to read

Grammar *

	1	2	3	4	5	
Incorrect written grammar pervasive	○	○	○	○	◉	Excellent written grammar

Comments about readability and grammar

There were many figures that you never discuss or do not mention by name (e.g. fig 6). This means that I got a bit lost sometimes and I kind of missed the impact of some of the analysis that you did because I didn't know what the figure was supposed to show me.

Data Partitioning

Appropriateness of data partitioning into training (choosing parameters), validation (choosing the best model), and testing (estimating performance on independent data) *

	0	1	2	3	4	
Did not partition the data	○	○	○	○	◉	Correctly partitioned the data

Comments on data partitioning

EDA and introduction

Quality of exploratory data analysis *

	0	1	2	3	
Did not perform EDA	○	○	○	◉	Performed a thorough EDA and presented appropriate and appealing figures that highlighted the interesting parts of the data

Comments on EDA

Is figure 1 showing the correlation of features with a single voxel? With another feature? You don't mention figures 1 and 2 in your written text at all -- as a rule of thumb you should only ever include a figure if you discuss it!

The figures themselves are nice though -- I would prefer the text to be a little larger and I'm not sure that the legend adds much but these are minor points.

I liked your discussion of the voxel location clustering :). I always have fun zooming around in plotly plots! Good job trying to use consistent coloring between the heatmap and plotly plot.

Modeling

Appropriateness of regression methods *

	0	1	2	3	
Did not appropriately choose or implement regression methods	○	○	◉	○	Made sensible decisions in terms of choosing and implementing regression methods

Comments on regression methods (e.g. did the student try to fit the same model for each voxel or different models for each voxel - this makes more sense)

I like that you used a different model for each voxel - this makes a lot of sense but I would have liked to see some discussion on why.

You mention that one of your methods is the "standard linear model" but you don't explain how you implement it! How do you get around the large p small n problem? Some further explanation of how you used the regression methods you chose would have been very helpful.

Explained each of the model selection criteria (CV, ES-CV, AIC, AICc and BIC) *

	0	1	2	3	
Did not explain the model selection criteria	○	○	◉	○	Clearly outlined what each model selection criteria does and the relative pros and cons of each criteria

Correctly implemented and compared model selection criteria (including using the correct correlation criteria rather than MSE) *

	0	1	2	3	4	
Did not compare model selection criteria	○	○	○	◉	○	Correctly implemented the criteria, discussed strengths and weaknesses, and provided insightful figures for the comparison

Comments on implementation and comparison of modeling and model selection criteria

Good job discussing the relative pros and cons of each criterion, however it would have been good to explain in greater detail how these methods work in practice. This comes back to ensuring that your report can stand alone and be understood by someone without the background knowledge of what you are trying to do.

The listing makes it easy to read but means that a lot of the narrative is lost.

For your lambda plots in figure 5 -- the plots themselves are nice and simple which I like, but I would have tried to force nicer breaks for the x-axis. I am a little concerned about the behaviour of the CV and ES-CV plots...

I like that you did try to code up CV yourself to use the correct correlation measure (rather than MSE which is the default of the packages).

The paper for ESCV actually shows that it makes more sense to maximize tau (the L2 norm of the beta coefficients) rather than lambda itself...

Evaluation of model performance and diagnostic plots *

	0	1	2	3	4	
Did not evaluate model performance	○	○	◉	○	○	Thoroughly evaluated how well the models performed using correlation and provided insightful and appealing figures for diagnostic plots and model interpretation

Comments on model performance evaluation and diagnostic plots

On page 5 you print a table that I assume shows the final model for each voxel. I'm not sure that you discuss it though. "Upon closer inspection, the lowest performing voxels (V10, V11, V13, V16, and V20) all correspond to the second voxel cluster of poorly correlated features" -- this might refer to the table but it is not clear. It is an interesting observation to note though!

In general I find it hard to gain many insights from large tables and I prefer to have this information presented visually. Is the table also showing the same info as Figure 7? Help!! I'm lost!

It might have been nice to compare the performance (in terms of correlation) of each method for each voxel! You just showed the best test set correlation but gave little information about how other methods performed on each voxel. Perhaps this is what Figure 6 shows but you never mentioned Figure 6 anywhere so I couldn't see where you discussed it! It isn't clear what each black point corresponds to in the figure (are these the individual voxels?). Why are the correlations for LM so much lower? Is LM linear model? You never mentioned this acronym anywhere!

Good job using a Mahalanobis distance method to find outliers -- I am curious about how well this performs in such high dimensions though and would have liked to see some discussion on this point.

Interpretation of models *

	0	1	2	3	
Did not try to interpret the models	○	○	◉	○	Provided a thorough interpretation of the models

Comments on model interpretation

You had 592 features in common for all voxels? I'm confused about Figure 8 -- what do you mean "distribution of each feature for *two types of errors*" -- what types of errors? this isn't really explained in the body of the report either (it doesn't help that the only place figure 8 is mentioned is 4 pages earlier than it appears.

I like that you tried to see which images generated the highest response for V2 but this isn't really a model specific analysis.

Evaluation of model stability *

	0	1	2	3	
Did not discuss model stability	○	○	◉	○	Reasonable explored and discussed model stability

Comments on model stability evaluation

You mention figure 7 here as a histogram but figure 7 is a boxplot figure with no variance! Perhaps by figure 7 you actually mean figure 9? I like that you are showing how the correlation changes across bootstrap samples. Did you also compare if the same features were selected across bootstrap samples?

How well did the students model perform on val_feat (once I have completed estimated performance of all student's models you will receive a relative score out of 5) *

correlation of 0.607

Reproducibility and github stuff

Did the student provide all files and instructions in their github repo necessary for reproducing the results and report? *

	0	1	2	3	
Did not provide anything required for reproducibility	○	○	○	◉	Everything was provided and clearly named/described

Comments

I would have liked to see a few more R scripts each with a meaningful purpose. You have one single R script called GenerateFigures.R which does a whole lot more than just generate the figures! (It also does modelling, analysis, etc).

Other general comments

Next time you write a report like this (obviously not for 215!) go through and make sure that you discuss every single figure that appears in the report. I feel like your report would have had a much bigger impact if your writing was based more around your figures rather than forcing the reader to figure our which part of the report each figure was supposed to go with.

Try to read through your own report from the perspective of someone who lives outside your own brain and identify all of the places where something hasn't been explained or a reference is missing -- try to identify all points that might cause someone else reading it confusion. I actually do this every time I write a report and find it very helpful!

Try to keep the figures as close as possible to the location in the text where they are discussed. This helps a lot with reading the report!