Assingment 1 Report

Subject 4
Object- Scissors
ROI-Superial Temporal

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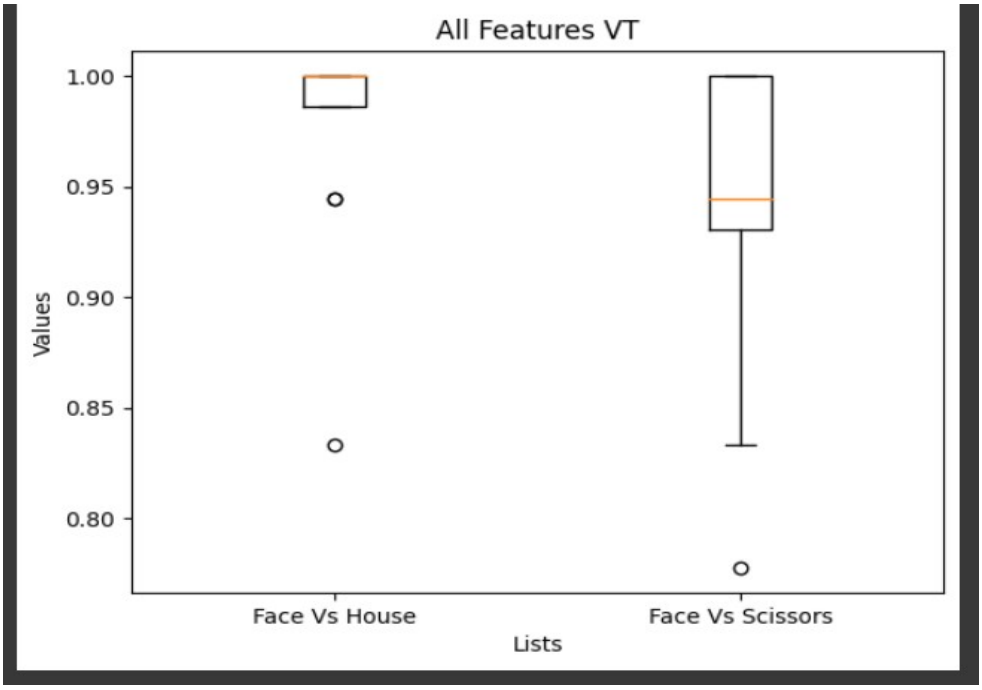
1. Ventral Temporal All Features



a. Face Vs House

Accuracy for test chunk 0: 1.0
Accuracy for test chunk 1: 1.0
Accuracy for test chunk 2: 1.0
Accuracy for test chunk 3: 1.0
Accuracy for test chunk 4: 0.9444444444444444
Accuracy for test chunk 5: 1.0
Accuracy for test chunk 6: 1.0
Accuracy for test chunk 7: 1.0
Accuracy for test chunk 8: 1.0
Accuracy for test chunk 9: 0.9444444444444444
Accuracy for test chunk 10: 1.0
Accuracy for test chunk 11: 0.8333333333333334

Mean Accuracy: 0.976851851851852
Standard Deviation: 0.04788926126291018

b.Face vs Scissors

Accuracy for test chunk 0: 0.9444444444444444
Accuracy for test chunk 1: 0.9444444444444444
Accuracy for test chunk 2: 1.0
Accuracy for test chunk 3: 1.0
Accuracy for test chunk 4: 1.0
Accuracy for test chunk 5: 0.9444444444444444
Accuracy for test chunk 6: 1.0
Accuracy for test chunk 7: 0.8888888888888888
Accuracy for test chunk 8: 0.8333333333333334
Accuracy for test chunk 9: 1.0
Accuracy for test chunk 10: 0.9444444444444444
Accuracy for test chunk 11: 0.7777777777777778

Mean Accuracy: 0.9398148148148149
Standard Deviation: 0.06975240358018224

Conclusion-

a. Face vs. House:

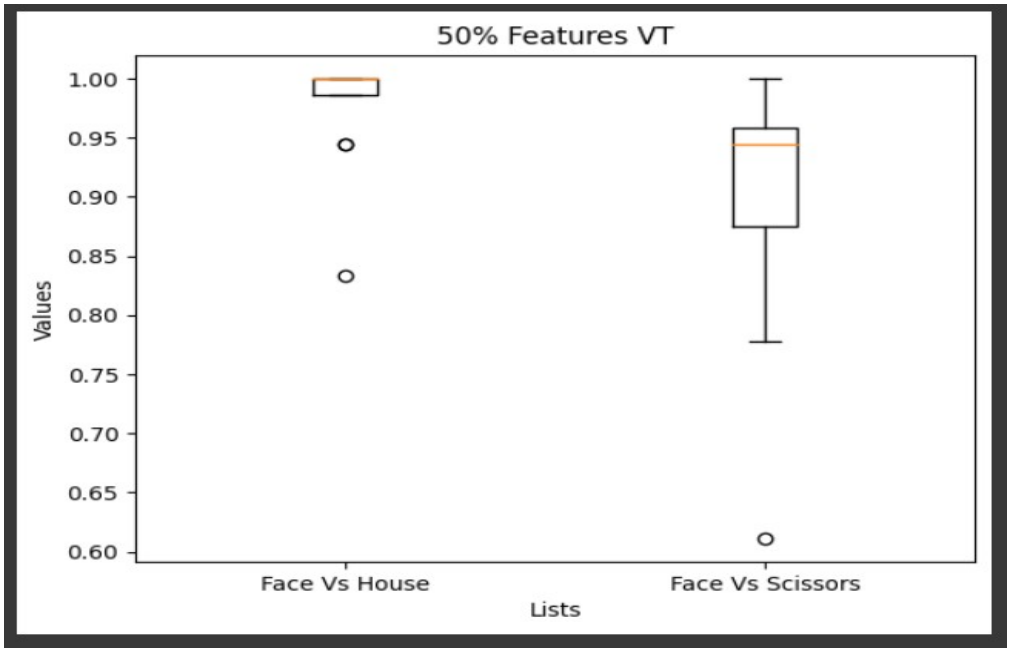
The classification accuracy for Face vs. House ranges from 0.833 to 1.0 across different test chunks.
The mean accuracy is approximately 0.977 with a standard deviation of 0.048, indicating high and consistent performance.

b. Face vs. Scissors:

The classification accuracy for Face vs. Scissors varies from 0.778 to 1.0 across different test chunks.
The mean accuracy is around 0.940 with a standard deviation of 0.070, suggesting overall good performance, though slightly less consistent than Face vs. House.

The model demonstrates robust performance in distinguishing between Face and House stimuli, with high accuracy and low variability.
For Face vs. Scissors, the model performs well on average but shows slightly more variability across different test chunks.
The results suggest that ventral temporal brain responses contain discriminative information for these two classification tasks, and the model is particularly effective in distinguishing faces from other stimuli.

2.Ventral Temporal 50% Random Features



a. Face Vs House

Accuracy for test chunk 0: 1.0
Accuracy for test chunk 1: 1.0
Accuracy for test chunk 2: 1.0
Accuracy for test chunk 3: 1.0
Accuracy for test chunk 4: 1.0
Accuracy for test chunk 5: 0.9444444444444444
Accuracy for test chunk 6: 1.0
Accuracy for test chunk 7: 1.0
Accuracy for test chunk 8: 1.0
Accuracy for test chunk 9: 0.9444444444444444
Accuracy for test chunk 10: 1.0
Accuracy for test chunk 11: 0.8333333333333334

Mean Accuracy: 0.976851851851852
Standard Deviation: 0.04788926126291018

b. Face vs Scissors

Accuracy for test chunk 0: 0.9444444444444444
Accuracy for test chunk 1: 0.9444444444444444
Accuracy for test chunk 2: 0.9444444444444444
Accuracy for test chunk 3: 0.9444444444444444
Accuracy for test chunk 4: 1.0

Accuracy for test chunk 5: 0.8888888888888888
Accuracy for test chunk 6: 1.0
Accuracy for test chunk 7: 0.8333333333333334
Accuracy for test chunk 8: 0.6111111111111112
Accuracy for test chunk 9: 1.0
Accuracy for test chunk 10: 0.9444444444444444
Accuracy for test chunk 11: 0.7777777777777778

Mean Accuracy: 0.9027777777777778
Standard Deviation: 0.10906684249434948

Conclusion:

a. Face vs House:

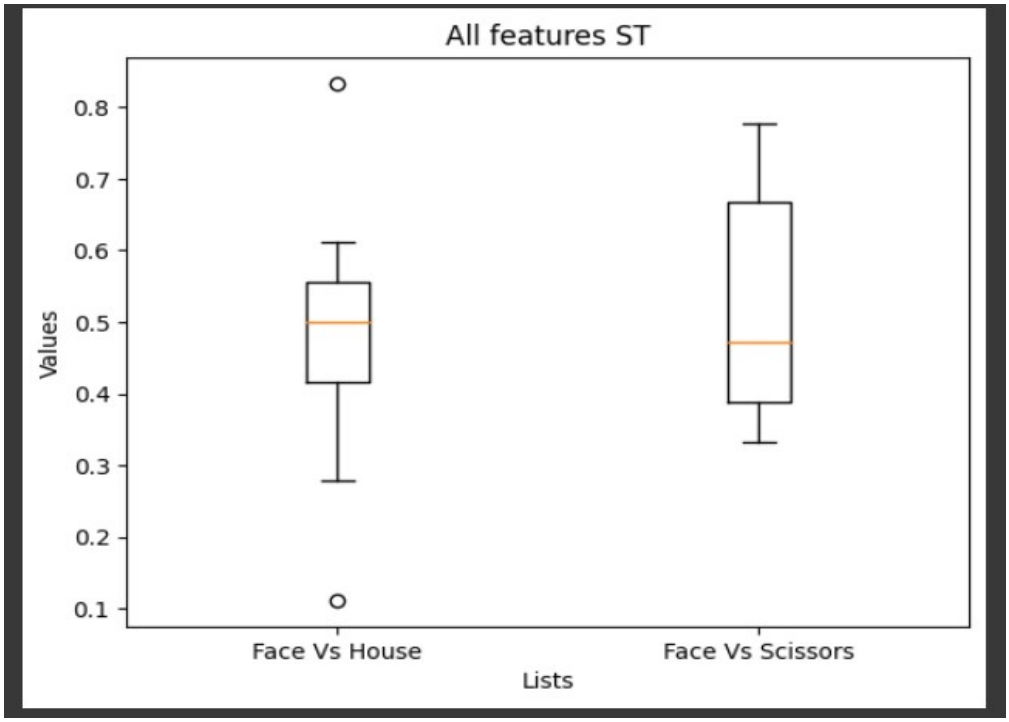
Consistently high accuracies ranging from 83.33% to 100% across different test chunks.
Overall mean accuracy: 97.69% with a low standard deviation of 4.79%.

b. Face vs Scissors:

Demonstrated good performance with accuracies ranging from 61.11% to 100%.
Overall mean accuracy: 90.28% with a standard deviation of 10.91%.

The outcomes highlight the effectiveness of the model in distinguishing between different visual stimuli, especially in Face vs House classification. The low standard deviations indicate a high level of consistency in the model's performance across different test chunks. These results reinforce the suitability of the ventral temporal region for decoding visual information, even when using a reduced set of random features.

3. Superial Temporal All Features



a. Face Vs House

Accuracy for test chunk 0: 0.2777777777777778
Accuracy for test chunk 1: 0.5
Accuracy for test chunk 2: 0.5555555555555556
Accuracy for test chunk 3: 0.5555555555555556
Accuracy for test chunk 4: 0.4444444444444444
Accuracy for test chunk 5: 0.8333333333333334
Accuracy for test chunk 6: 0.6111111111111112
Accuracy for test chunk 7: 0.5
Accuracy for test chunk 8: 0.5555555555555556
Accuracy for test chunk 9: 0.1111111111111111
Accuracy for test chunk 10: 0.3333333333333333
Accuracy for test chunk 11: 0.5

Mean Accuracy: 0.4814814814814814
Standard Deviation: 0.17322487901731212

b. Face Vs Scissors

Accuracy for test chunk 0: 0.3333333333333333
Accuracy for test chunk 1: 0.3333333333333333
Accuracy for test chunk 2: 0.6666666666666666
Accuracy for test chunk 3: 0.5
Accuracy for test chunk 4: 0.3888888888888889
Accuracy for test chunk 5: 0.3888888888888889
Accuracy for test chunk 6: 0.7777777777777778
Accuracy for test chunk 7: 0.3888888888888889
Accuracy for test chunk 8: 0.5
Accuracy for test chunk 9: 0.4444444444444444
Accuracy for test chunk 10: 0.6666666666666666
Accuracy for test chunk 11: 0.6666666666666666

Mean Accuracy: 0.5046296296296297
Standard Deviation: 0.1460352805146991

Conclusion:

a. Face vs House:

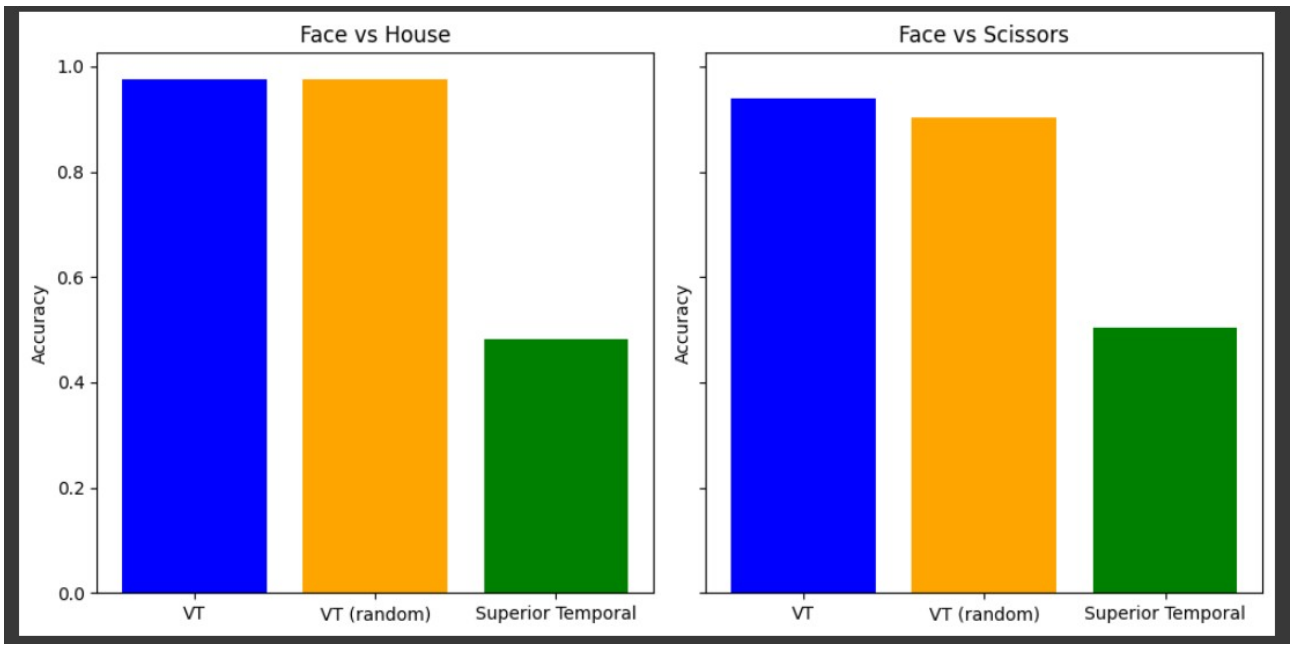
Achieved varying accuracies across different test chunks, ranging from 11.11% to 83.33%.
Overall mean accuracy: 48.15% with a standard deviation of 17.32%.

b. Face vs Scissors:

Displayed mixed performance with accuracies ranging from 33.33% to 77.78%.
Overall mean accuracy: 50.46% with a standard deviation of 14.60%.

The results suggest that decoding visual stimuli in the superior temporal region is more challenging compared to ventral temporal regions.
The substantial standard deviations indicate a considerable variability in the model's performance across different test chunks.
It implies that superior temporal regions might not be as specialized for visual decoding as ventral temporal regions.

Comparison Of Mean Accuracy Between All ROI



VT's Superior Performance: VT demonstrates the highest accuracy in distinguishing faces from both houses and scissors, outperforming both VT (random) and Superior Temporal.

Decreased Accuracy of VT (random): The accuracy of VT (random) is lower than that of VT, but still higher than Superior Temporal in both comparisons.

Superior Temporal's Lower Accuracy: Superior Temporal has the lowest accuracy in distinguishing faces from houses and faces from scissors.

These results suggest that VT may be more effective in distinguishing faces from other objects compared to other methods. However, further research may be needed to confirm these findings and explore the reasons behind the differences in accuracy.