

# RATS 5

Neuroscience Research under Fortin Labs UCI

## Preliminary Results and Data Analysis

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## **Goal**

To decode the hippocampal neurons

## **Why**

By decoding the hippocampal neurons, we'll be able to see the patterns and distinguish what odor the rats think of just by looking at the neural patterns.



# What we did

- Build a multinomial logistic regression model
- Implement LASSO for dimensionality reduction
  - Implement PCA
  - Confusion matrix
- Train on different time windows

# Confusion Matrix for Different Time Frames

	True					
Predicted	1	2	3	4	5	Total
1	1	0	0	0	0	1
2	31	50	18	8	3	110
3	0	0	1	0	0	1
4	8	0	10	25	8	51
5	16	0	10	1	20	47
Total	56	50	39	34	31	210

**0 to 250 ms**

Percent Correct: 41%

	True					
Predicted	1	2	3	4	5	Total
1	38	1	4	1	3	47
2	18	49	28	16	5	116
4	0	0	5	17	9	31
5	0	0	2	0	14	16
Total	56	50	39	34	31	210

**500 to 750 ms**

Percent Correct: 44%

	True					
Predicted	1	2	3	4	5	Total
1	19	0	1	0	3	23
2	21	29	13	6	7	76
3	16	21	18	18	10	83
4	0	0	7	10	11	28
Total	56	50	39	34	31	210

**250 to 500 ms**

Percent Correct: 36%

	True					
Predicted	1	2	3	4	5	Total
2	21	50	11	4	0	86
4	7	0	12	25	8	52
5	28	0	16	5	23	72
Total	56	50	39	34	31	210

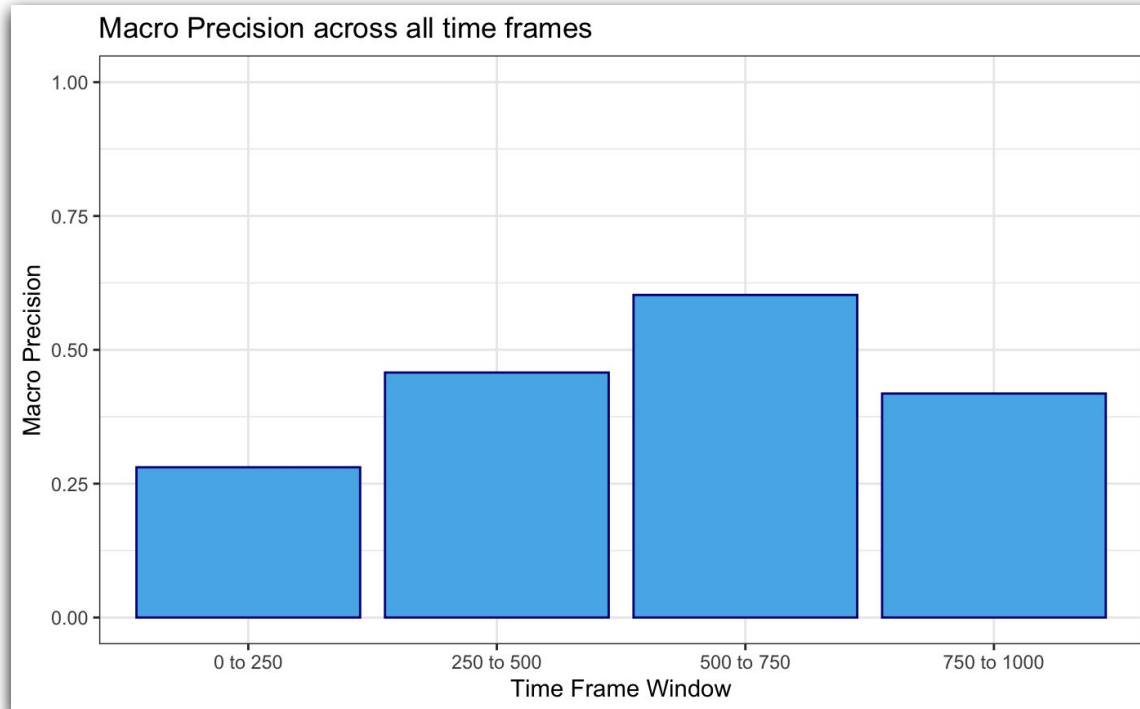
**750 to 1000 ms**

Percent Correct: 42%



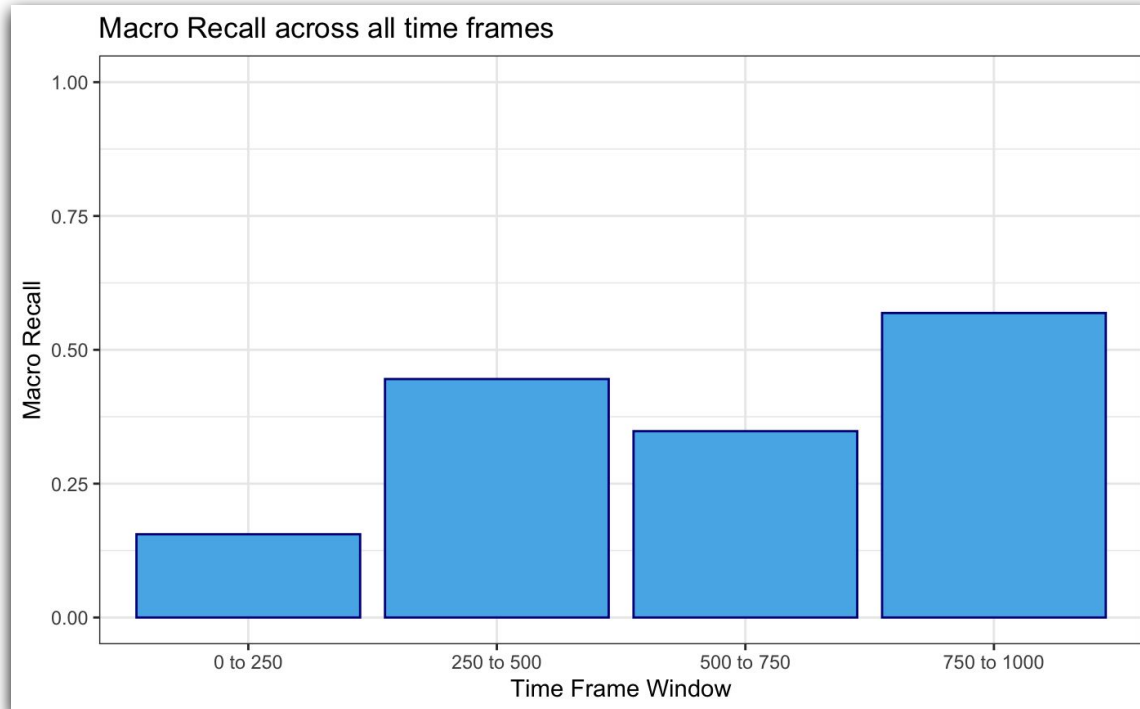
# Macro Precision

This graph highlights the average precision of our model across various time frames.



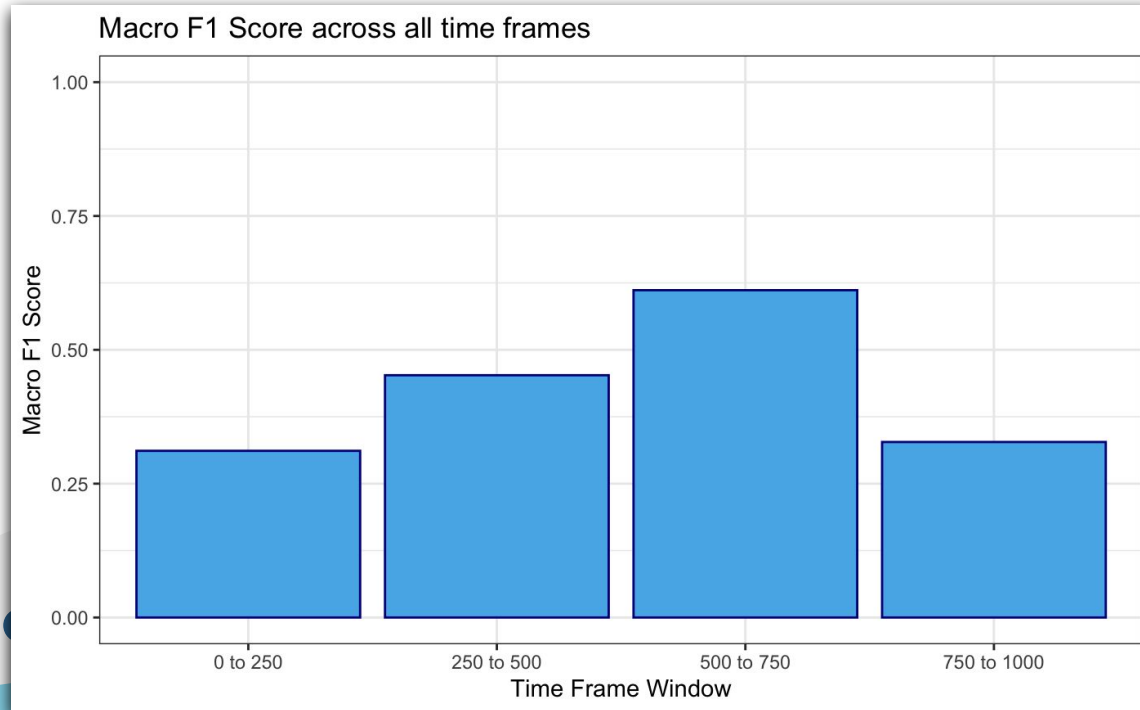
# Macro Recall

This graph highlights the average macro recall of our model across various time frames.



# Macro F1 Score

This graph highlights the average macro F1 scores of our model across various time frames.



# Thank you!

