

# Linking the time course of visual feature coding to behaviour



Tijl Grootswagers<sup>1</sup>, Amanda K. Robinson<sup>2</sup>, Sophia M. Shatek<sup>3</sup>, Thomas A. Carlson<sup>3</sup>

1 | The MARCS Institute for Brain, Behaviour, and Development, Western Sydney University

2 | The University of Queensland 3 | The University of Sydney

t.grootswagers@westernsydney.edu.au

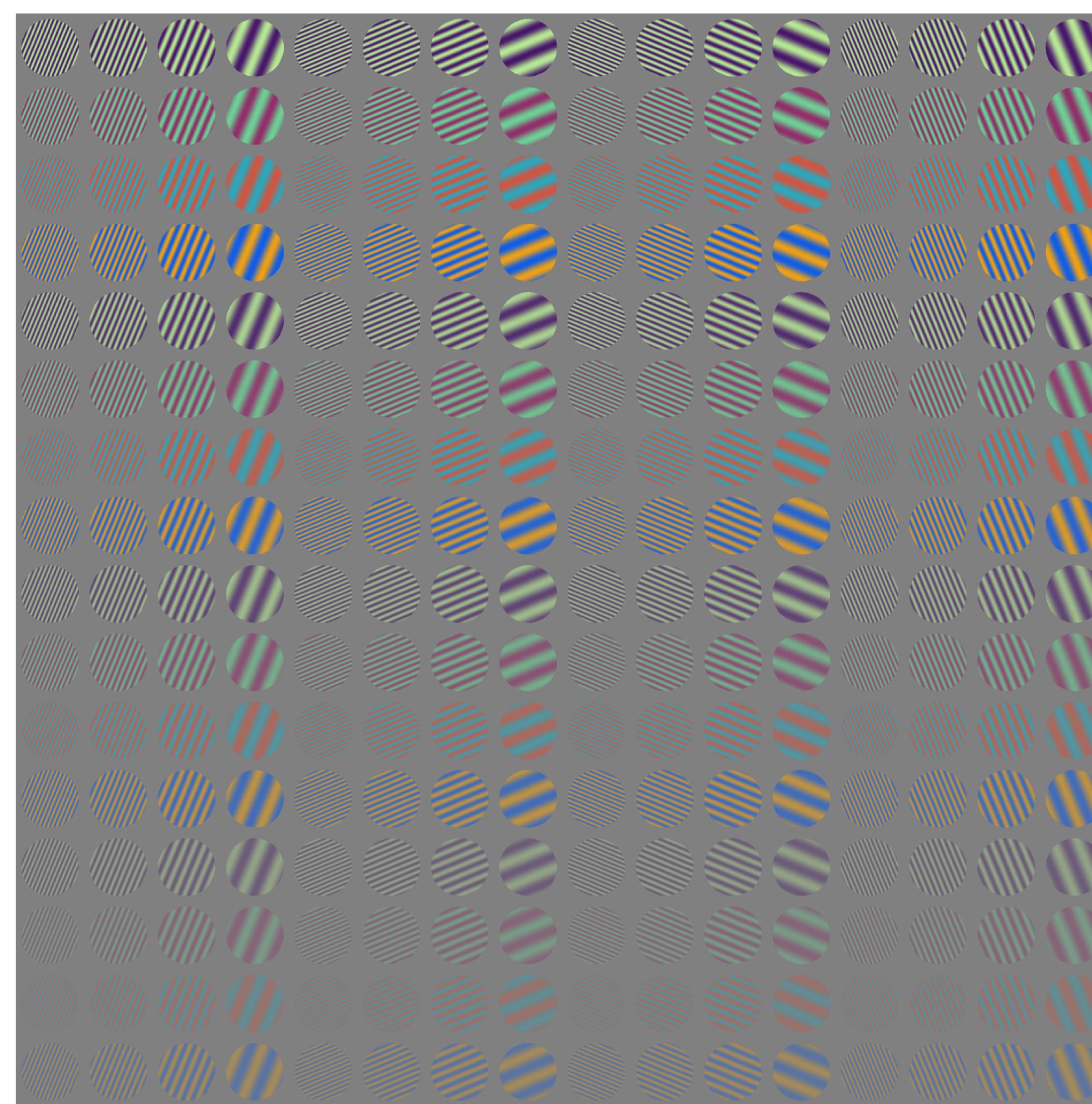
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## Introduction

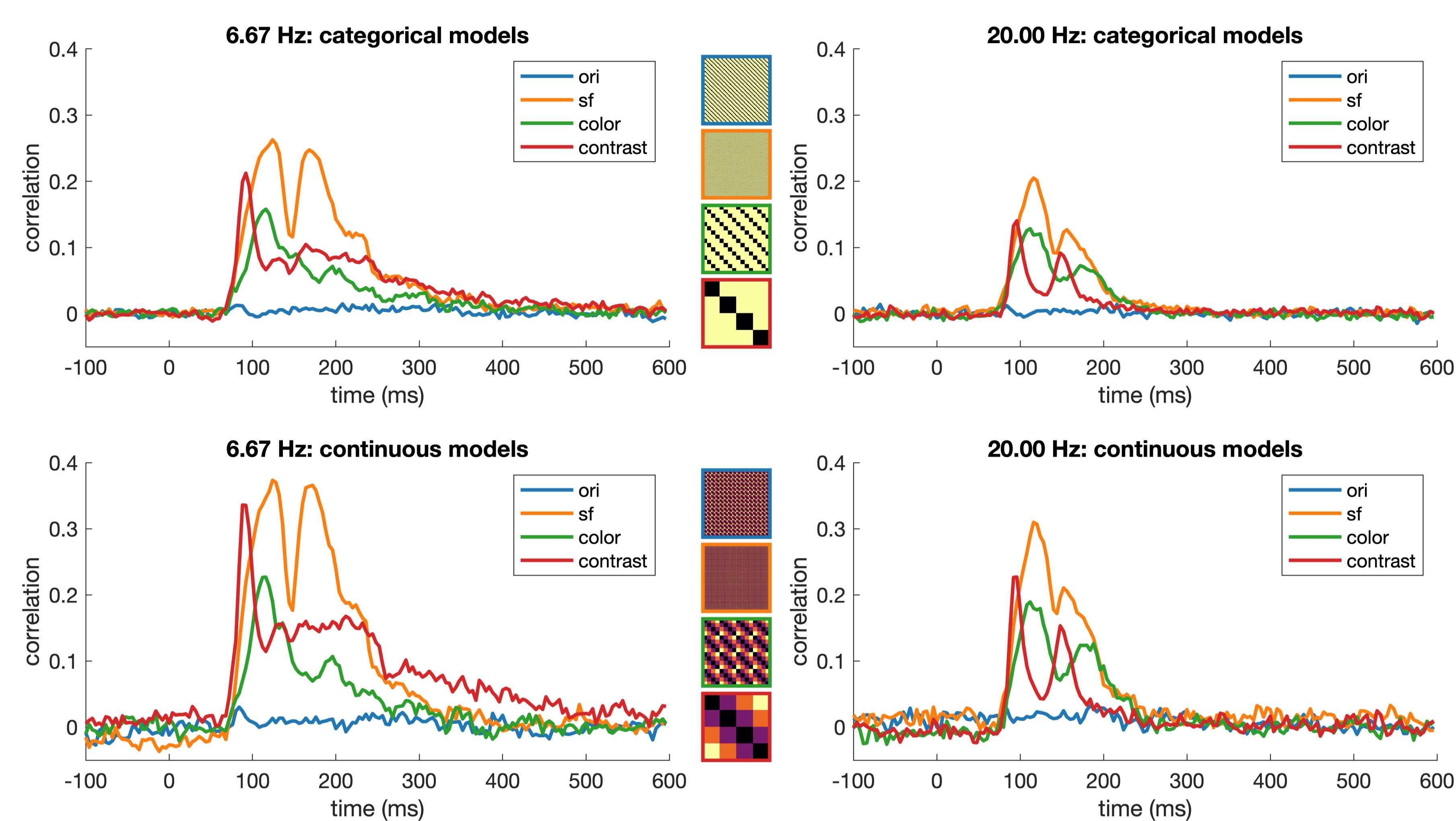
- Early visual cortex encodes basic visual features<sup>[1]</sup>
- Time-course of individual feature coding?<sup>[2,3]</sup>
- How does encoding performance relate to behavioural judgements of similarity?<sup>[3]</sup>

## Methods

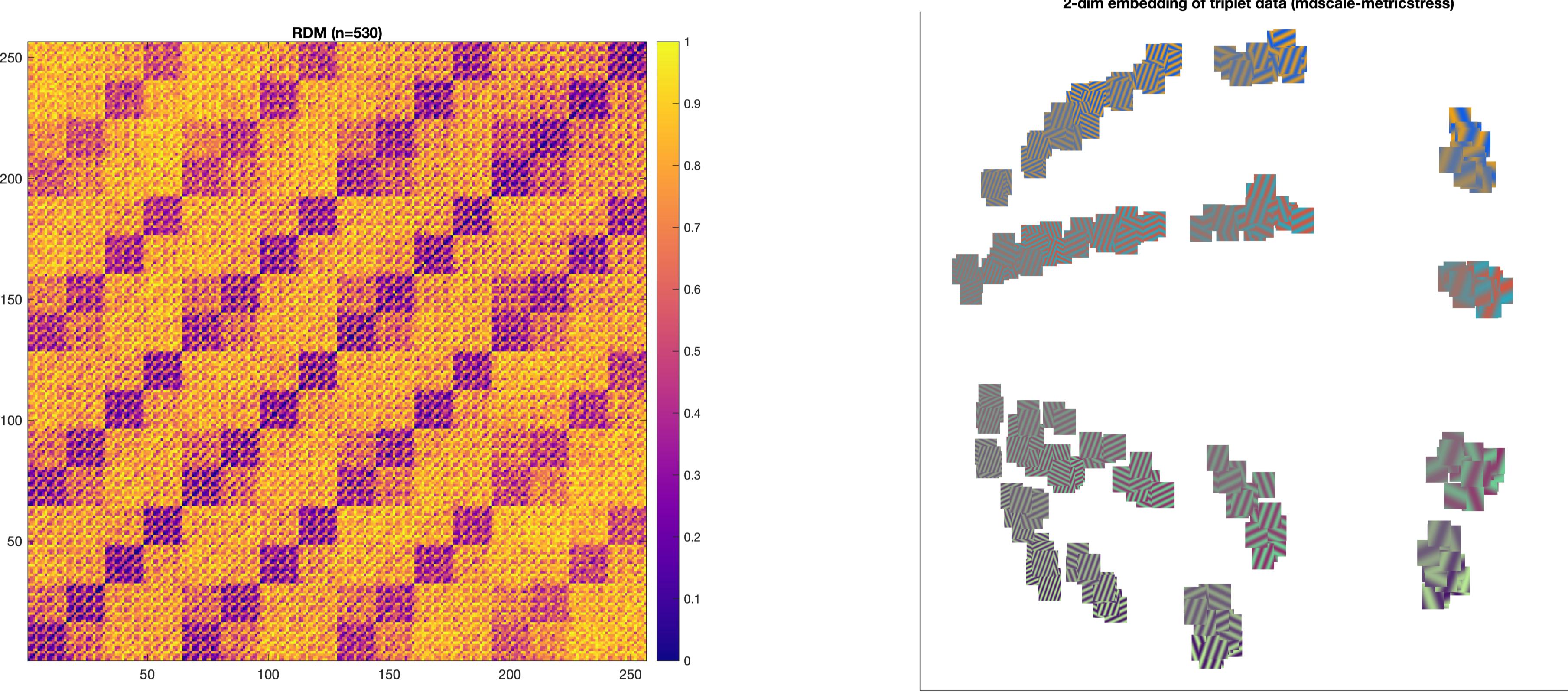
- 256 visual grating stimuli varying in:  
**Orientation** | **spatial frequency** | **color** | **contrast**
- Presented in **6.67Hz** and **20Hz** RSVP sequences<sup>[4]</sup>
- 64-channel EEG (Brainvision actichamp) n=16
- Online triplet odd-one-out task n=530
- Representational Similarity Analysis relating EEG to behaviour & test contribution of feature models



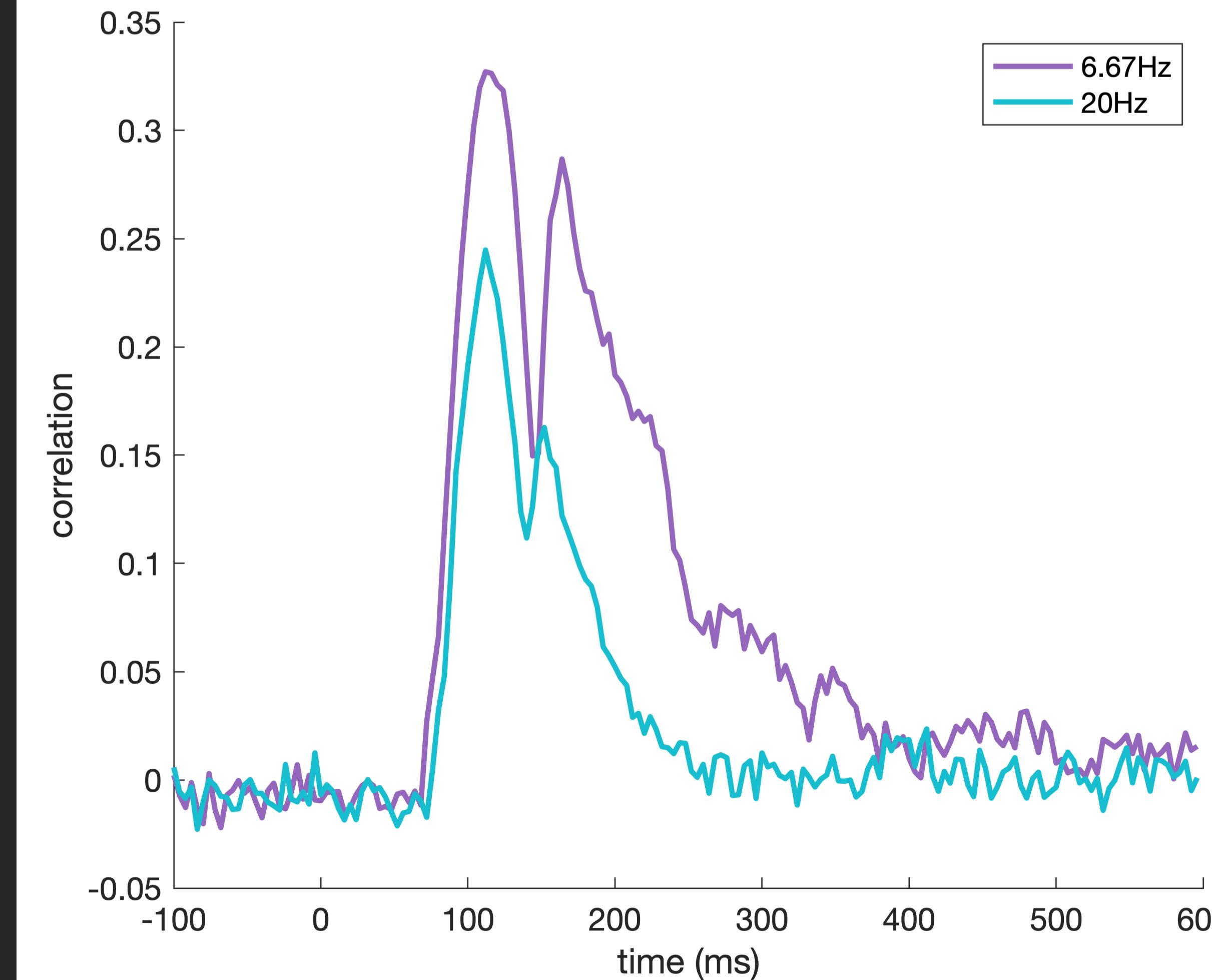
## Feature model correlations with EEG



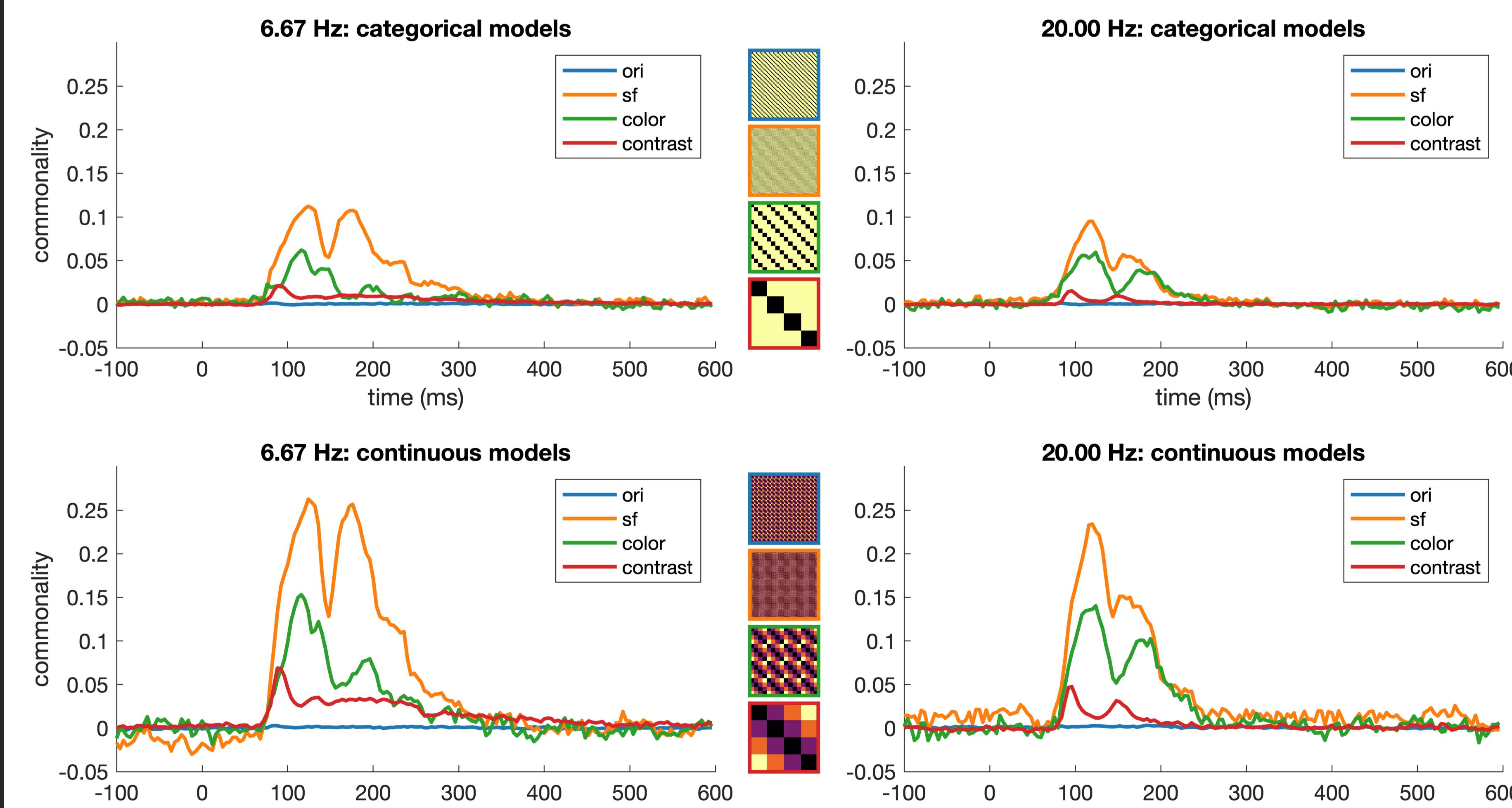
## Human similarity judgements



## EEG-behaviour correlation



## Model contributions to EEG-behaviour correlation



## Conclusions

- Visual feature coding with different time-courses
- Human similarity ratings strong predictor of EEG
- Contributions of feature models in the EEG differs from their contribution to behaviour

## References

1. Grill-Spector, K., Malach, R., 2004. The Human Visual Cortex. *Annual Review of Neuroscience* 27, 649–677.
2. Ramkumar, P., Jas, M., Pannasch, S., Hari, R., Parkkonen, L., 2013. Feature-Specific Information Processing Precedes Concerted Activation in Human Visual Cortex. *J. Neurosci.* 33, 7691–7699.
3. Wardle, S.G., Kriegeskorte, N., Grootswagers, T., Khaligh-Razavi, S.-M., Carlson, T.A., 2016. Perceptual similarity of visual patterns predicts dynamic neural activation patterns measured with MEG. *NeuroImage* 132, 59–70.
4. Grootswagers, T., Robinson, A.K., Carlson, T.A., 2019. The representational dynamics of visual objects in rapid serial visual processing streams. *NeuroImage* 188, 668–679.