How distributed are short-term memory representations of visual motion?

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Introduction

We have recently demonstrated successful decoding of stimulus-specific patterns of BOLD activity throughout the delay period of a delayed-recognition task for visual motion (Riggall & Postle, 2012).

Q1 Results: Spatial distribution of representations

Approach: Compute decoding performance for all possible combinations of ROIs, isolate best performing combination.

1. Extract top 25% most ‘important’ voxels

2. Compute continuous overlap of ‘important’ voxels

3. Compute any overlap of ‘important’ voxels

Results: Spatial distribution of representations

Q2 Results: Temporal stability of representations

Approach: Extract “important” voxels and compare how much they overlap with the “important” voxels from other timepoints

1. Extract top 25% most ‘important’ voxels

Results: Temporal stability of representations

Future: Dynamic pattern or sampling larger stable pattern?

Conclusions

The patterns that support decoding of visual motion memory representations are spatially confined to posterior visual regions

These patterns appear to be temporally dynamic, but future work will be required to further determine the details of these dynamics

Distributed decoding approaches provide valuable insight into the neural representations used for short-term storage

References


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