Web Appendix: Shrinkage Parameters for 12 Seed Regions

In this document, we display the estimated shrinkage parameters on 6 sagittal slices of the brain from two subjects that are randomly selected from the Kirby21 data set. Our selection of the seeds ROIs include several regions in the visual cortex such as the cuneus, superior occipital gyrus (SOG), middle occipital gyrus (MOG) and inferior occipital gyrus (IOG). We have also investigated the middle frontal gyrus (MFG) and the cingulate. These seed choices cover a range of brain networks from the inferior to middle to frontal regions. In each figure, the first two rows are pointwise and local shrinkage parameters for the first subject, and the bottom two rows are for the second subject. The brighter color indicates higher $\gamma(v)$ and less shrinkage towards the population average. The colors are normalized within each subject over multiple brain slices and across two shrinkage methods. The range of the values are shown in the legend bars on the upper left corner of the first slice for each subject. The middle row shows the seed regions in red.

1 Cuneus

Figure 1 shows the maps of shrinkage parameters for Subjects 2 (top two rows) and 3 (bottom two rows) in estimating the correlation map with left and right Cuneus.
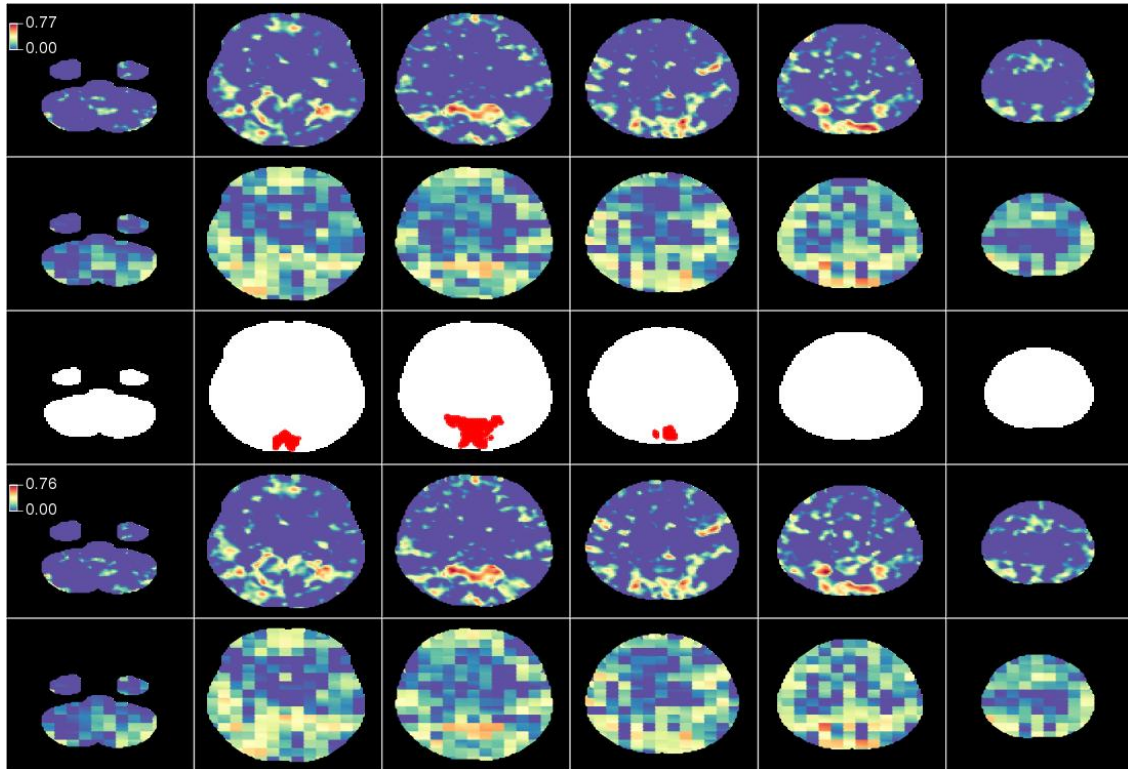

Figure 1: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 2. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 2. Third row: maps of seed region Cuneus on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 3. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 3.

2 Left SOG

Figure 2 shows the maps of shrinkage parameters for Subjects 4 (top two rows) and 17 (bottom two rows) in estimating the correlation map with left SOG.
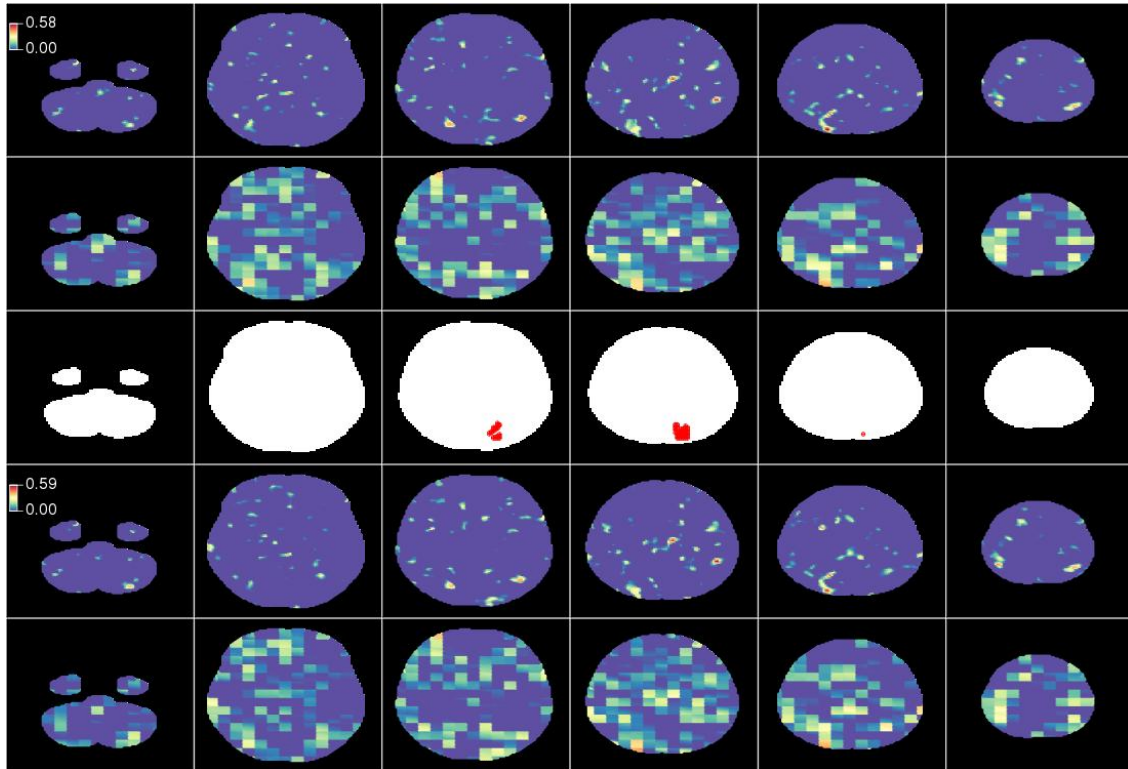

Figure 2: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 4. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 4. Third row: maps of seed region left SOG on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 17. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 17.

3 Right SOG

Figure 3 shows the maps of shrinkage parameters for Subjects 7 (top two rows) and 9 (bottom two rows) in estimating the correlation map with right SOG.
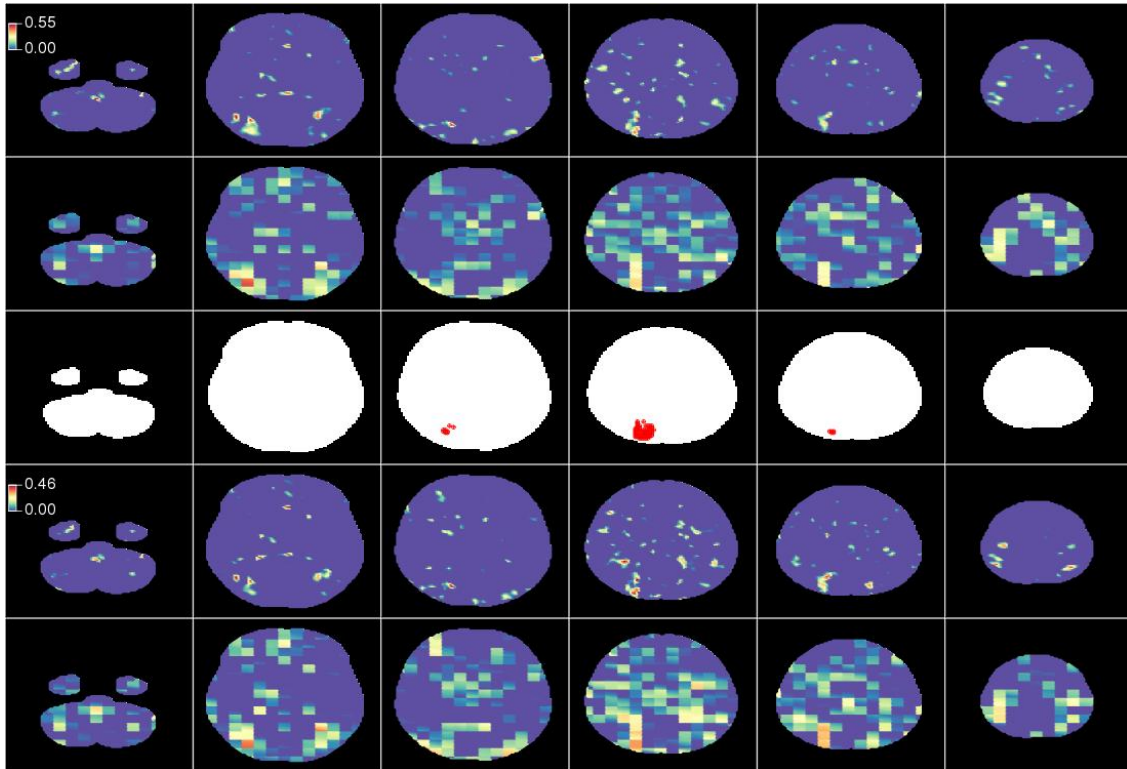

Figure 3: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 7. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 7. Third row: maps of seed region right SOG on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 9. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 9.

4   Left MOG

Figure 4 shows the maps of shrinkage parameters for Subjects 18 (top two rows) and 19 (bottom two rows) in estimating the correlation map with left MOG.
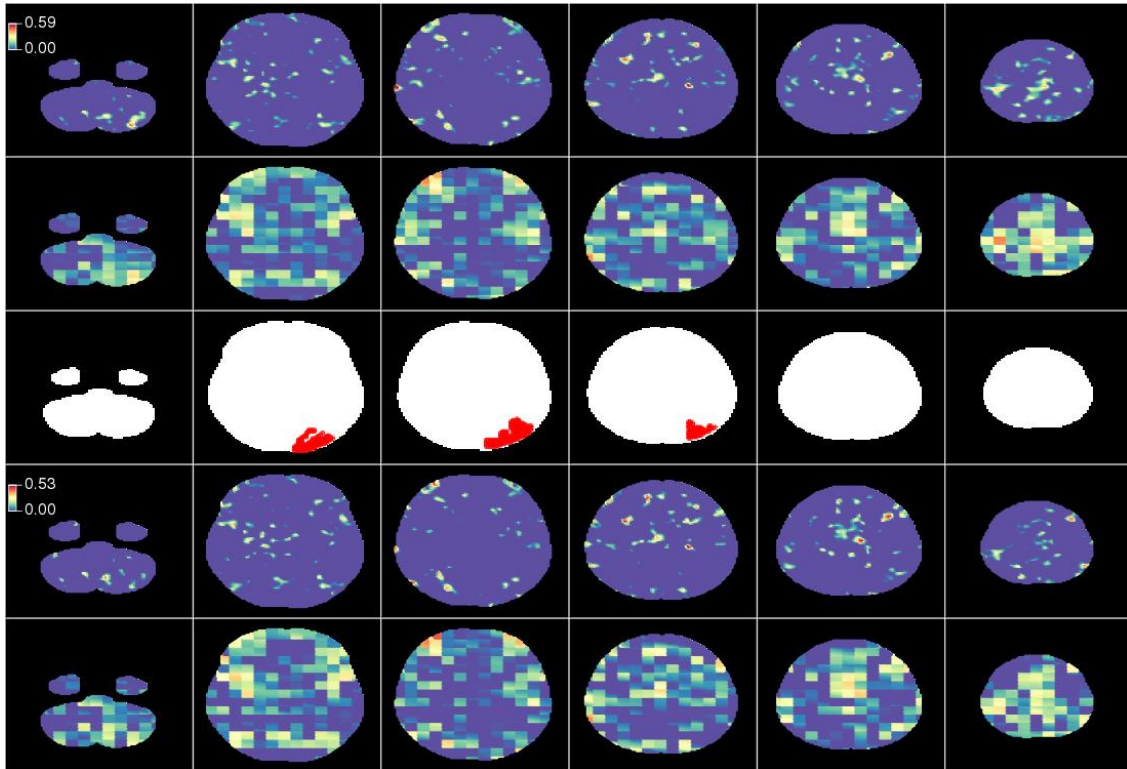

Figure 4: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 18. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 18. Third row: maps of seed region left MOG on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 19. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 19.

5 Right MOG

Figure 5 shows the maps of shrinkage parameters for Subjects 2 (top two rows) and 6 (bottom two rows) in estimating the correlation map with right MOG.
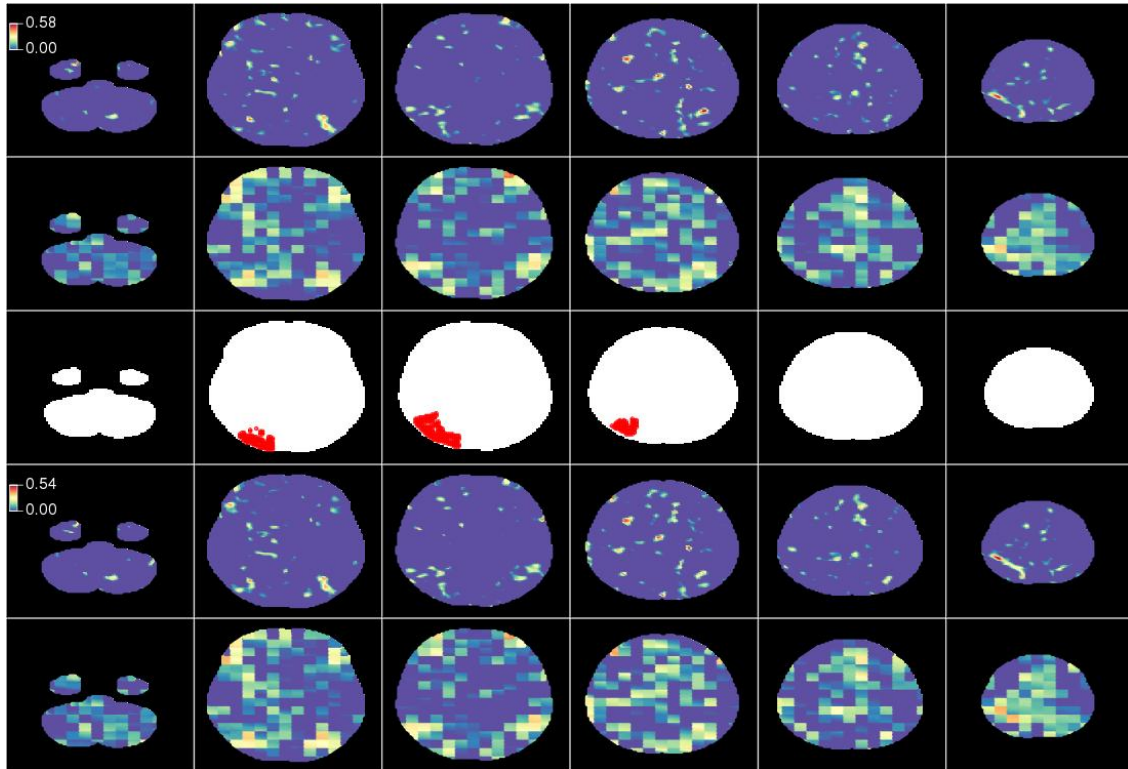

Figure 5: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 2. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 2. Third row: maps of seed region right MOG on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 6. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 6.

6   Left IOG

Figure 6 shows the maps of shrinkage parameters for Subjects 8 (top two rows) and 14 (bottom two rows) in estimating the correlation map with left IOG.
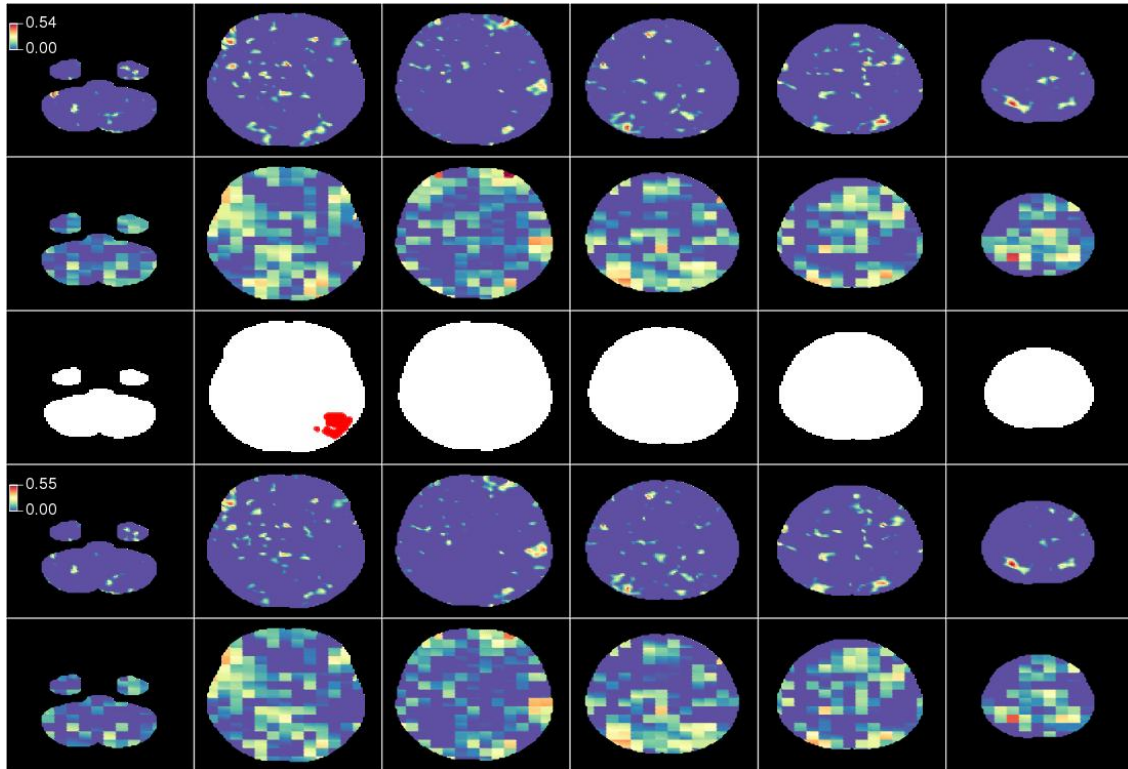

Figure 6: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 8. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 8. Third row: maps of seed region left IOG on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 14. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 14.

7 Right IOG

Figure 7 shows the maps of shrinkage parameters for Subjects 13 (top two rows) and 15 (bottom two rows) in estimating the correlation map with right IOG.
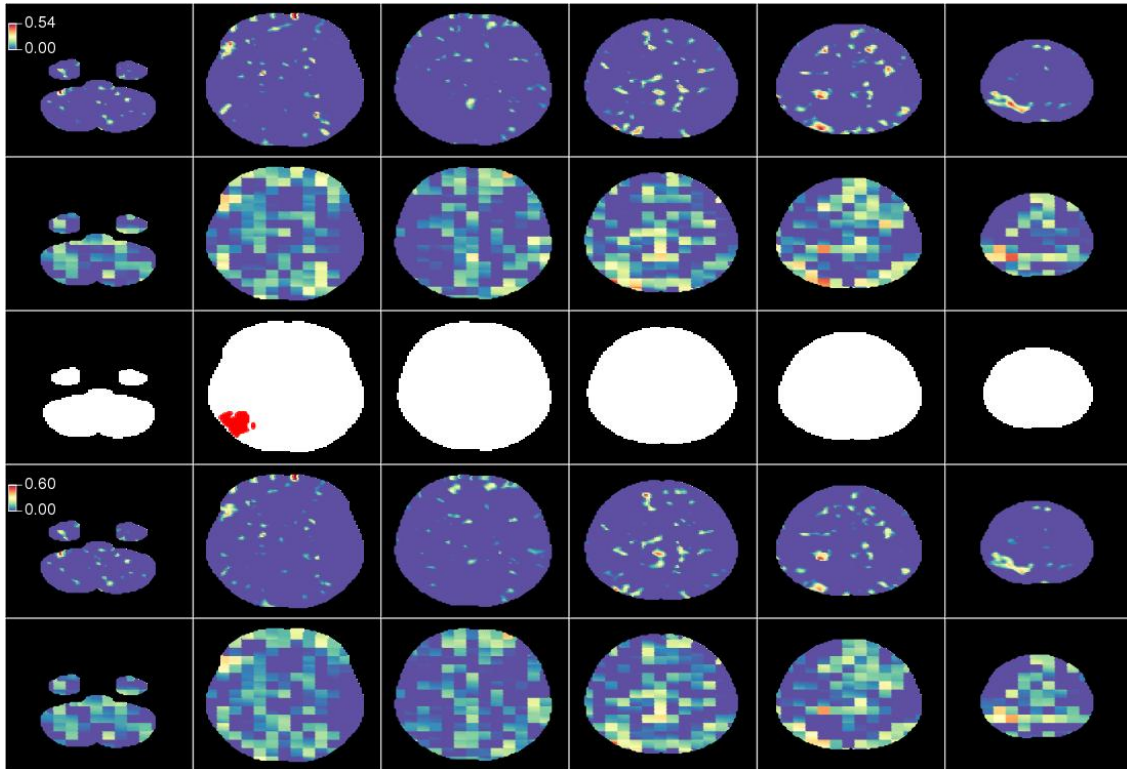

Figure 7: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 13. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 13. Third row: maps of seed region right IOG on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 15. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 15.

8   Left MFG

Figure 8 shows the maps of shrinkage parameters for Subjects 10 (top two rows) and 20 (bottom two rows) in estimating the correlation map with left MFG.
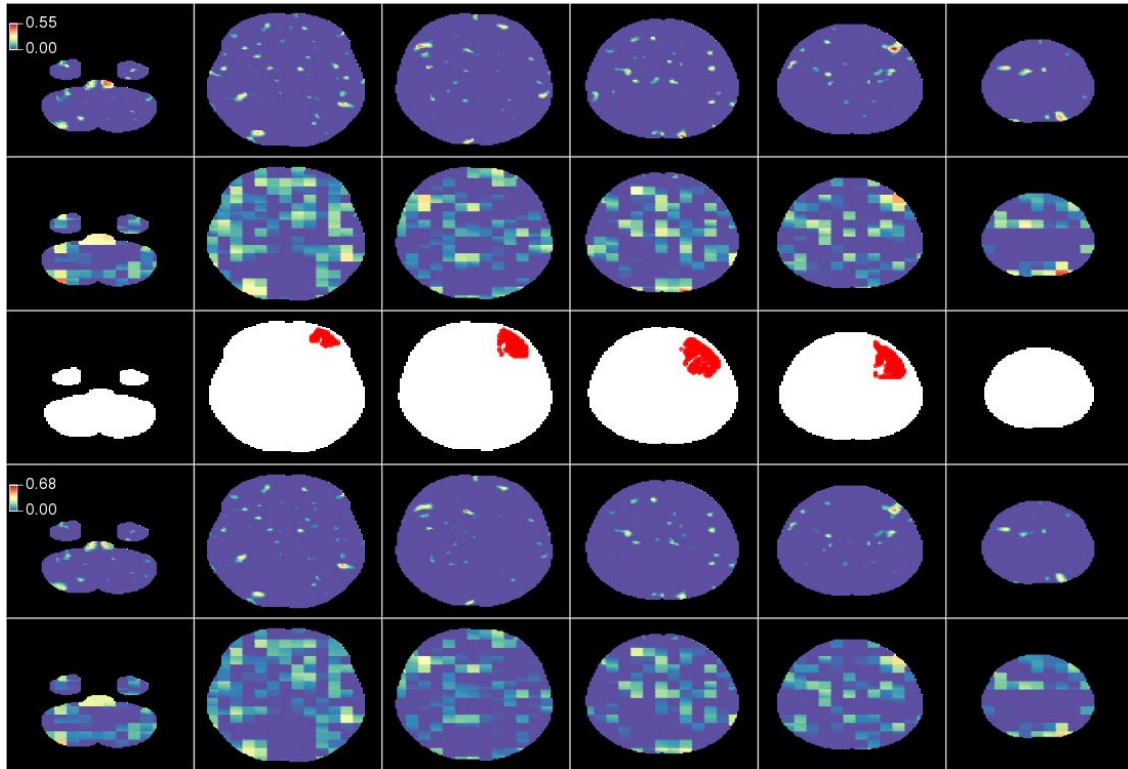

Figure 8: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 10. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 10. Third row: maps of seed region left MFG on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 20. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 20.

9 Right MFG

Figure 9 shows the maps of shrinkage parameters for Subjects 5 (top two rows) and 16 (bottom two rows) in estimating the correlation map with right MFG.
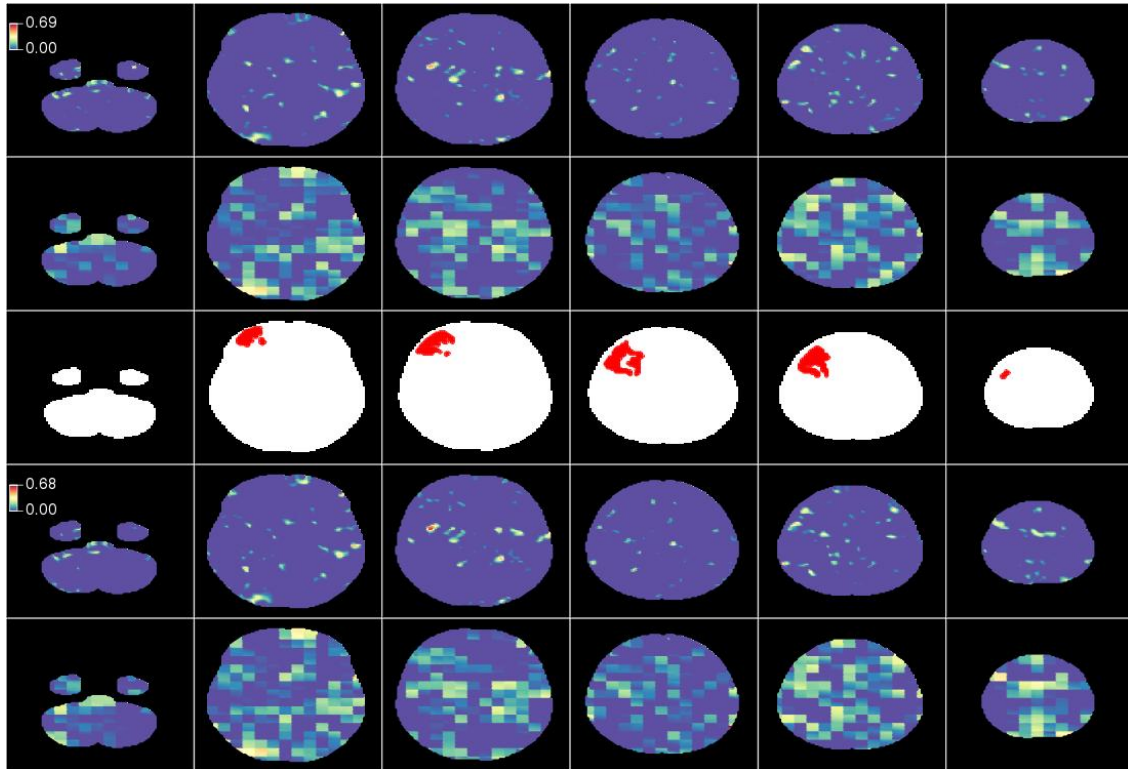

Figure 9: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 5. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 5. Third row: maps of seed region right MFG on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 16. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 16.

10 Left Cingulate

Figure 10 shows the maps of shrinkage parameters for Subjects 2 (top two rows) and 11 (bottom two rows) in estimating the correlation map with left cingulate.
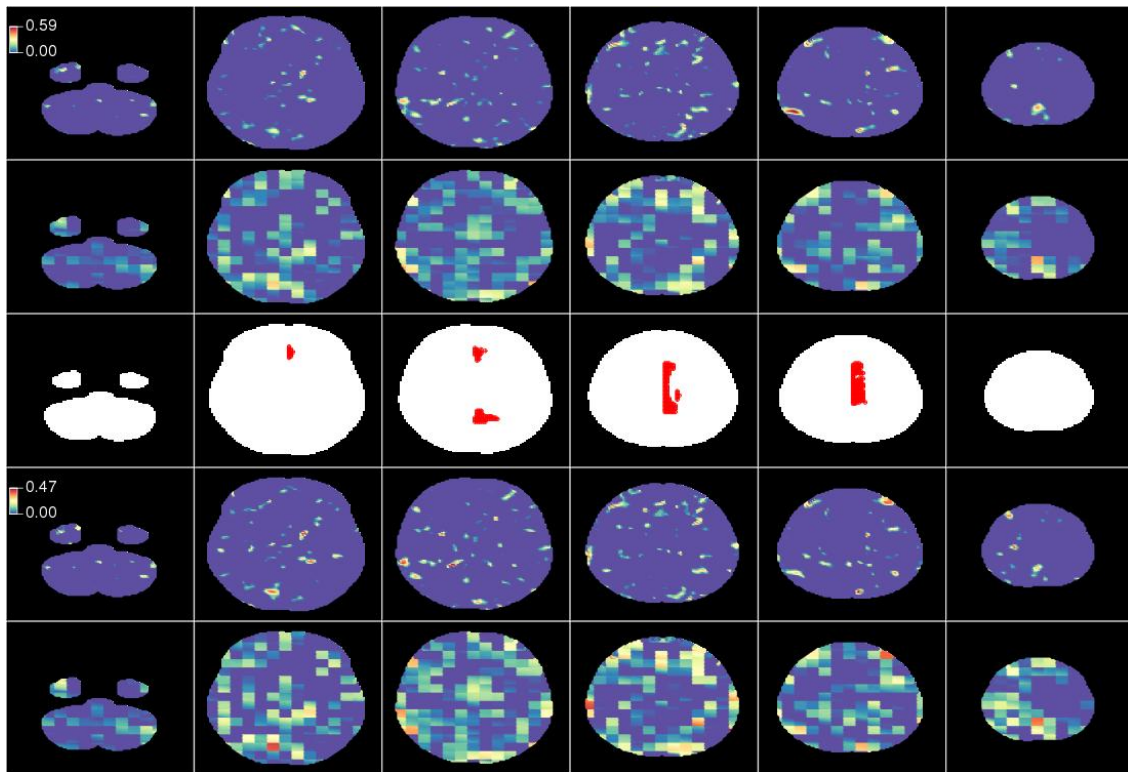

Figure 10: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 2. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 2. Third row: maps of seed region left cingulate on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 11. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 11.

11 Right Cingulate

Figure 11 shows the maps of shrinkage parameters for Subjects 10 (top two rows) and 19 (bottom two rows) in estimating the correlation map with right cingulate.
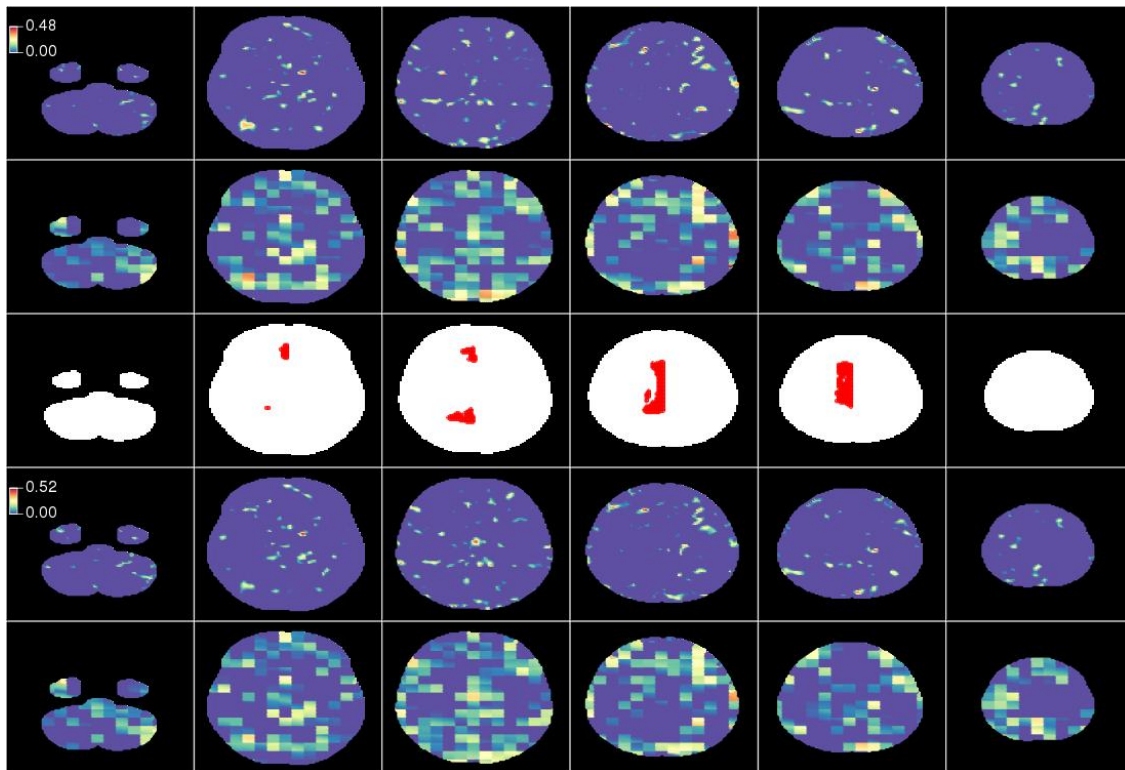

Figure 11: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 10. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 10. Third row: maps of seed region right cingulate on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 19. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 19.

12   Precentral Gyrus

Figure 12 shows the maps of shrinkage parameters for Subjects 2 (top two rows) and 3 (bottom two rows) in estimating the correlation map with left and right Cuneus.
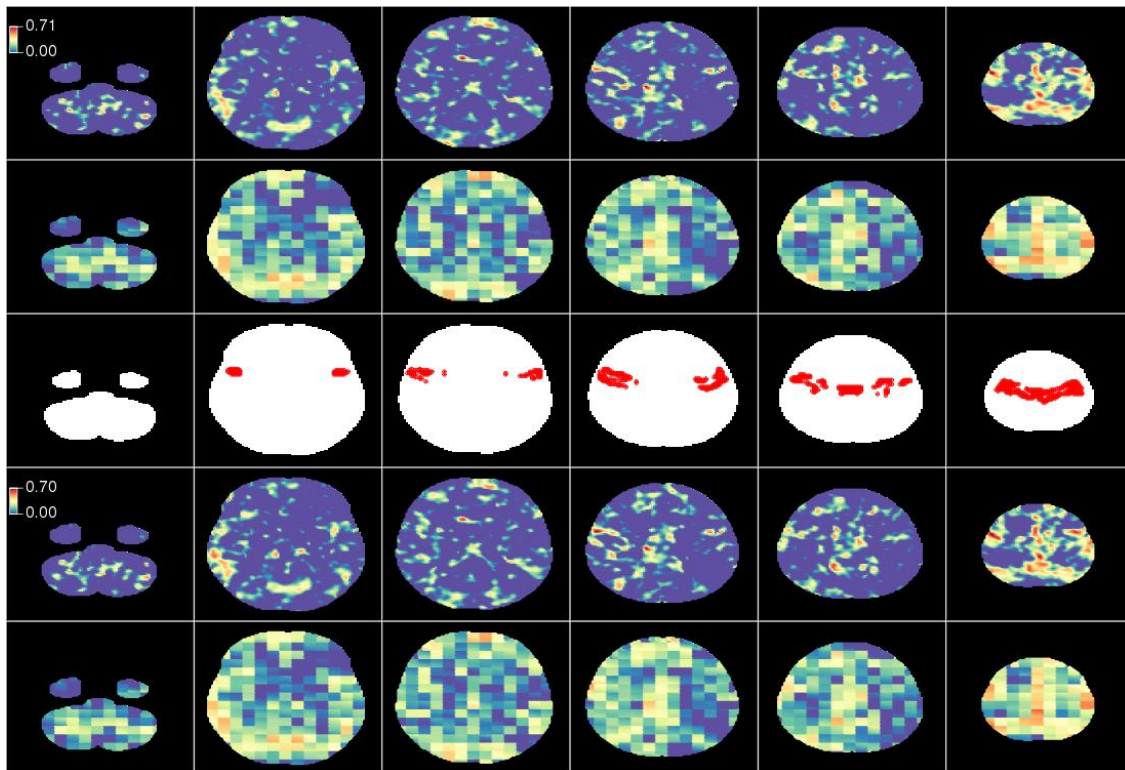

Figure 12: First row: maps of the shrinkage parameters $\gamma(v)$ on 6 sagittal slices for the pointwise shrinkage method in predicting Subject 1. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 1. Third row: maps of seed region Precentral gyrus on brain slices. Fourth row: maps of the shrinkage parameters on the same 6 slices for the pointwise shrinkage method in predicting Subject 12. Second row: maps of the shrinkage parameters on the same 6 slices for the local shrinkage method in predicting Subject 12.