

VertexWiseR: a R package for simplified vertex-wise analyses of whole-brain and hippocampal surfaces v.1.3.1



data base

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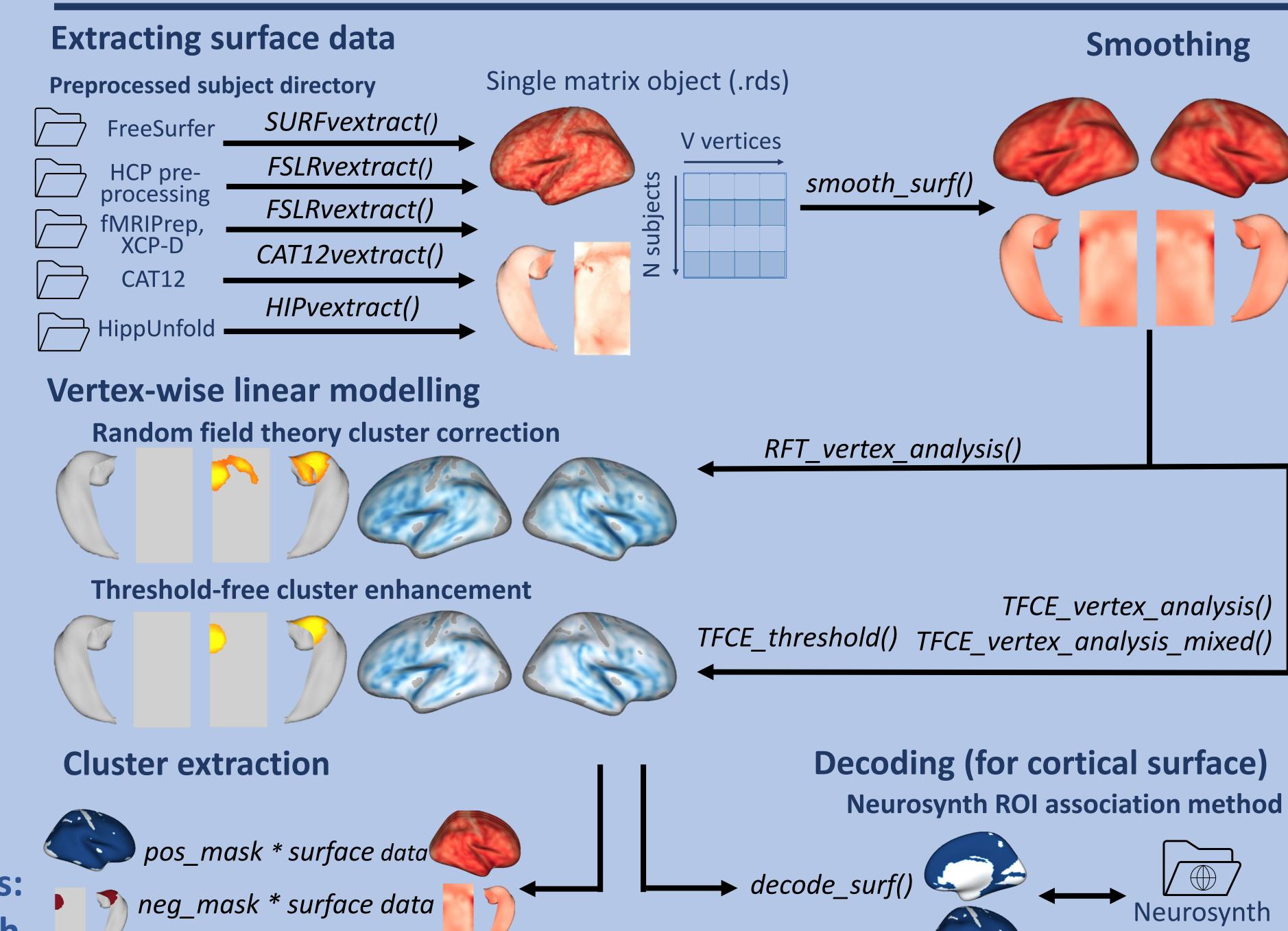
Simplifying surface-based analyses across preprocessing softwares

- Extracts surface data of whole cohorts from preprocessing directories
- Creates small and highly compressed wholebrain or hippocampal surface object
- With this, no need to access the initial data directories or software environments
- Linear models, mixed models, with random field theory and threshold-free cluster enhancement cluster corrections

Compatibilities

- Compatible with Windows, Mac and Linux
- For data in fsaverage5, faverage6, fsLR32k,
 CIT168 templates
- Any vertex-wise measure in the above spaces: thickness, curvature, gyrification, sulcal depth etc.

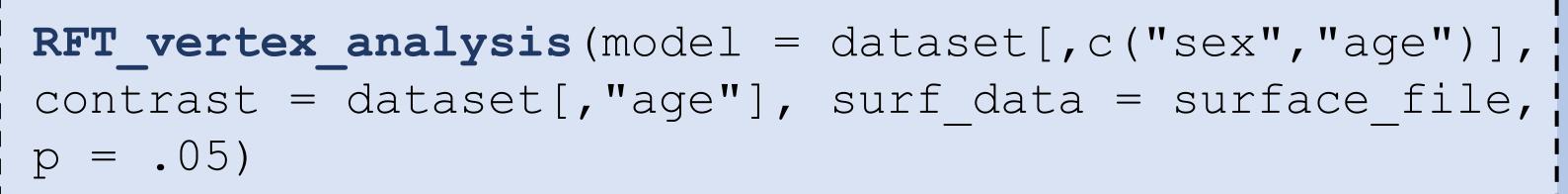
Workflow



Demo 1



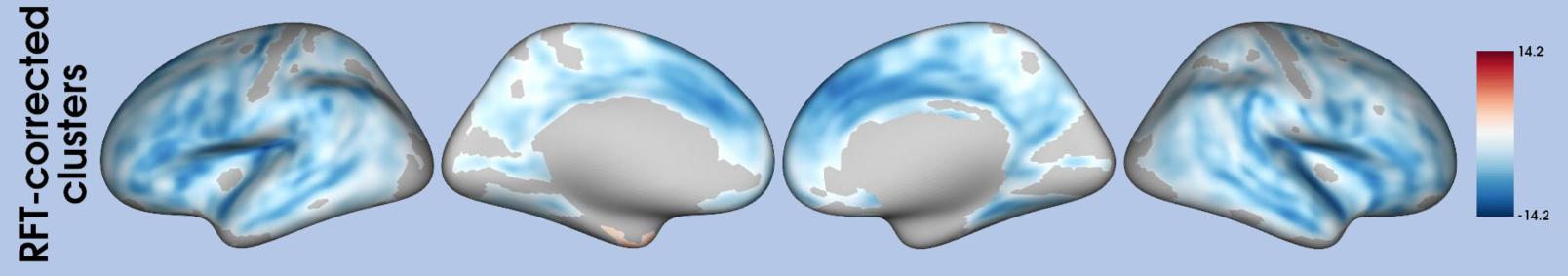
OpenNeuro dataset (ds003592)¹, ageing study with 238 participants, preprocessed with FreeSurfer²



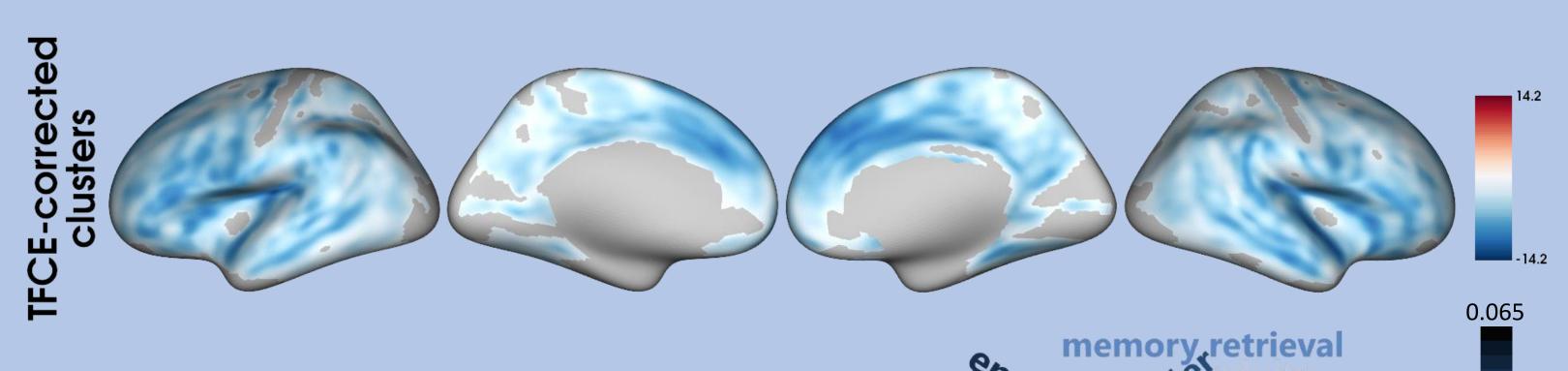
TFCE_vertex_analysis(model= dat_beh[,c("sex","age")],
contrast = dat_beh[,"age"], surf_data= surface_file,
nperm=1000)

Age effect on cortical thickness, controlling for sex:

- cluster correction with random field theory



- cluster correction with threshold-free cluster enhancement

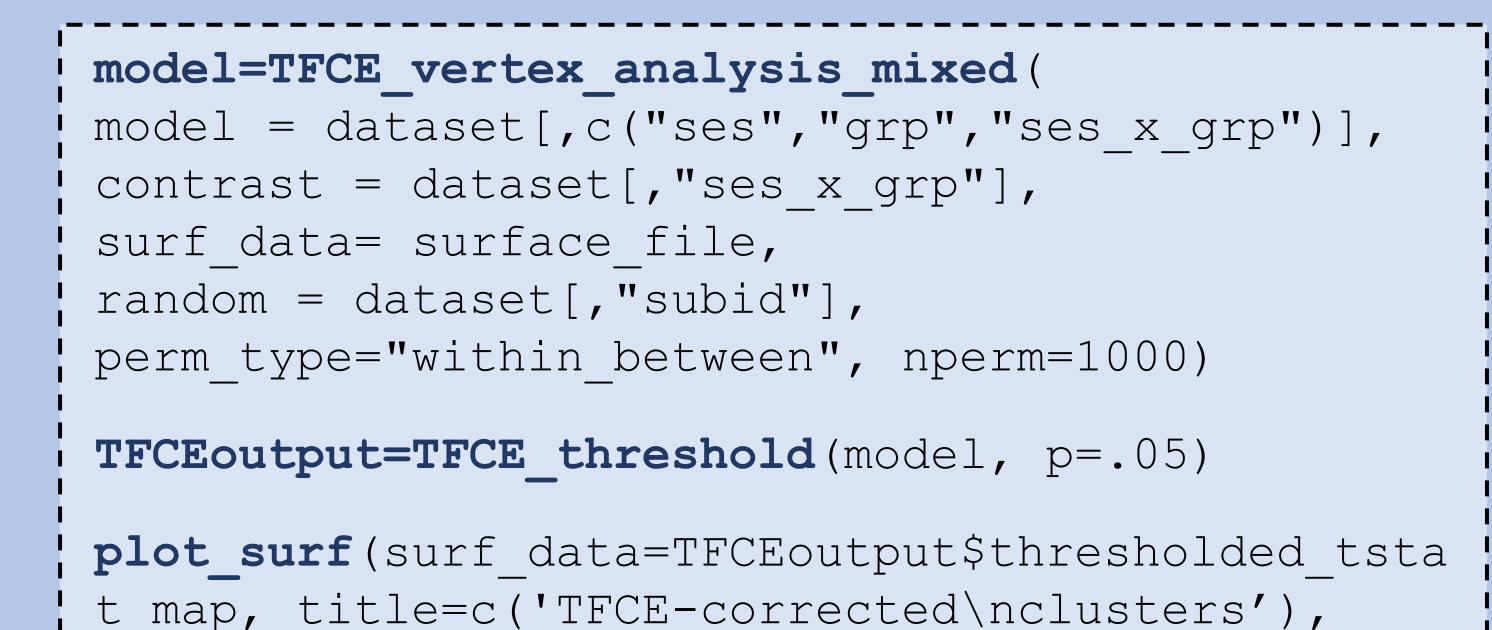


Meta-analytic decoding, associating the cluster coordinates with past fMRI literature keywords:

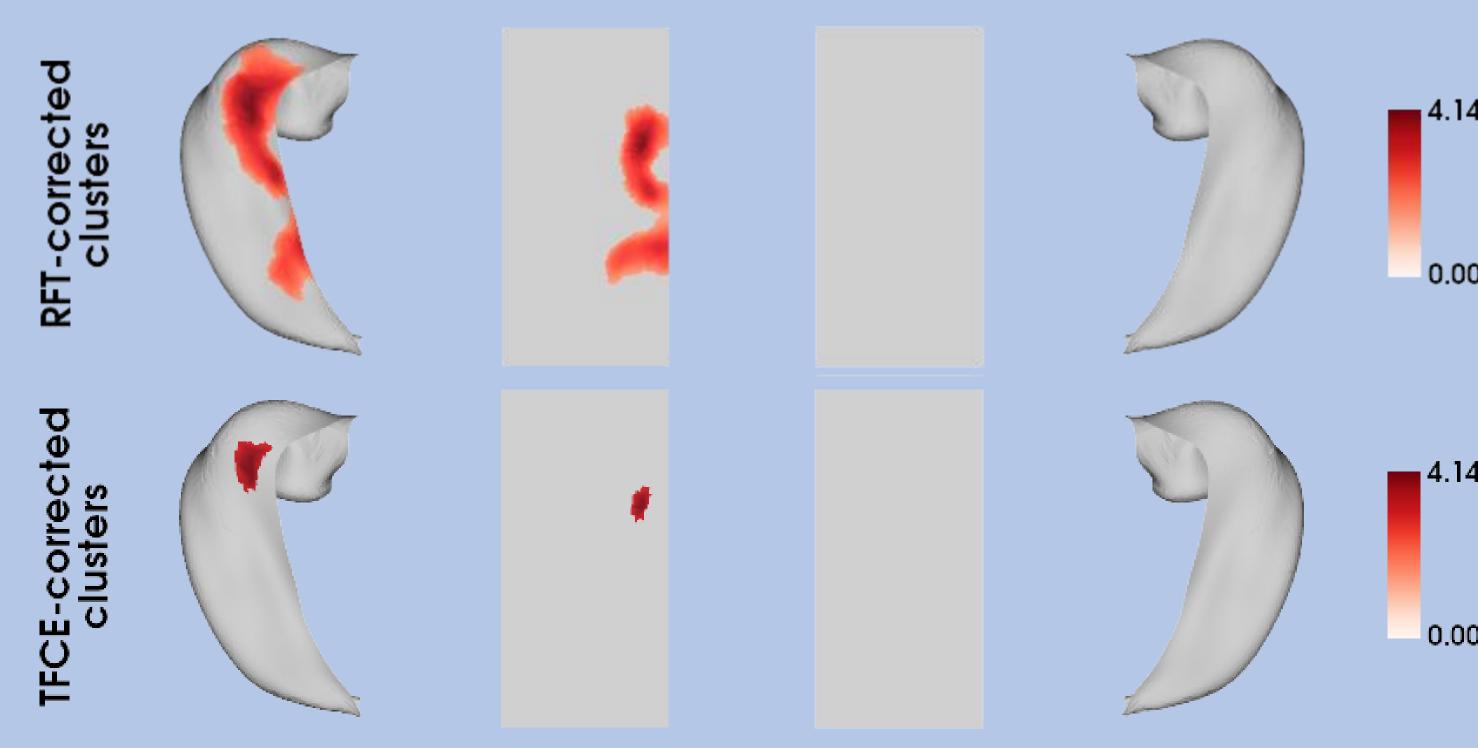


Demo 2

OpenNeuro dataset (ds003799)³, 48 participants; running intervention study, preprocessed with HippUnfold⁴



Session and group interaction effect on hippocampal thickness, controlling for sex:



References

https://doi.org/10.7554/eLife.88404

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- 2. Fischl, B. (2012). FreeSurfer. NeuroImage, 62(2), 774–781. https://doi.org/10.1016/j.neuroimage.2012.01.021
- Fink, A., Koschutnig, K., Zussner, T., Perchtold-Stefan, C. M., Rominger, C., Benedek, M., & Papousek, I. (2021). A two-week running intervention reduces symptoms related to depression and increases hippocampal volume in young adults. Cortex, 144, 70–81. https://doi.org/10.1016/j.cortex.2021.08.010
 DeKraker, J., Palomero-Gallagher, N., Kedo, O., Ladbon-Bernasconi, N., Muenzing, S. E., Axer, M., Amunts, K., Khan, A. R., Bernhardt, B. C., & Evans, A. C. (2023). Evaluation of surface-based hippocampal registration using ground-truth subfield definitions. eLife, 12, RP88404.

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cmap='Reds')

Website →

Contains tutorials, updates, details of every function

