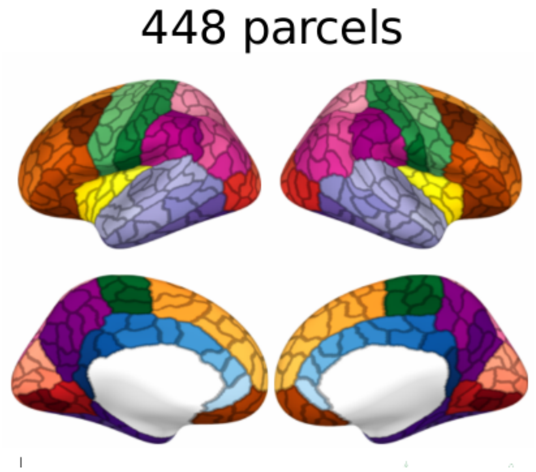
README

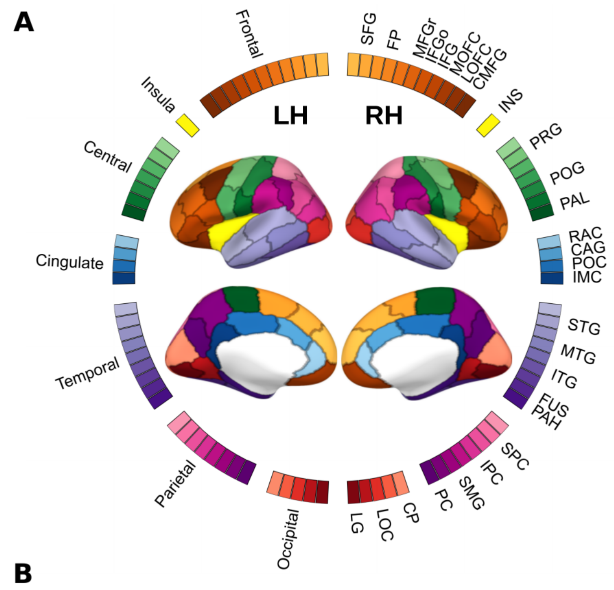
1 Notes

- PDF and BIB files: ./aux-refs/
- Parcellations/annotations ./aux-annots/fsaverage/label/
- All parcellations transformed to `fsaverage`:
  - `?h.aparc.annot`
    * Desikan-Killiany Atlas (Desikan et al., 2006)
    * Available as a standard option in FreeSurfer/MNE distribution
  - `?h.aparc_sub.annot`
    * A more detailed version of the Desikan-Killiany Atlas (Desikan et al., 2006)
    * Includes sub-parcellations based on Khan et al. (2018)
      · QUOTE: **Cortical parcellation (labels)** *FreeSurfer was used to automatically divide the cortex into 72 regions* (Dale et al., 1999). *After discarding "medial wall" and "corpus callosum", these regions were further divided in to a total of N = 448 cortical "labels (Fig. S4)", so that each label covers a similar area again using FreeSurfer.* <u>*We employed this high-resolution parcellation scheme because cortical surface is very convoluted and averaging across a large label, which crosses multiple sulci and gyri, can result in signal cancellation across the parcel*</u>*. Lastly,* <u>*a high-resolution parcellation also reduces the dependence of the results on the specific selection of the parcels*</u>*.*
    * NB: Recently used in Ruuskanen and Avendano-Diaz (n.d.)
      · Sub-parcellations were methodologically justified in the context of addressing the same problem we face
      · QUOTE: **Cortical parcellation** *To decrease computational complexity and increase interpretability, we employed a cortical parcellation to reduce the dimensionality of the source-space data. To that end, the data were organized into 448 ROIs as defined in the aparc sub parcellation scheme developed by Khan and colleagues (Khan et al., 2018) based on the Desikan–Killiany atlas.*

· QUOTE: *The time courses within each ROI were then averaged to form a representative time series. To prevent signal cancellation at the opposite sides of sulci, a sign-flip operation was applied to the signals of the sources whose orientation differed from the dominant direction within the ROI by more than 90○. The use of a relatively dense parcellation further reduces signal cancellation and flattening during the averaging procedure.*



· BTW: ↓ Not a bad template for localization visualization (if one adds a histogram to such circle).



* NB: Interestingly, both Khan et al. (2018) and Ruuskanen and Avendano-Diaz (n.d.) relied on `?h.aparc_sub.annot` to solve a problems very similar to the ones we discussed today.
* `BTW: ?h.aparc_sub_FIXED.annot` contains manually corrected

label strings.

- `?h.HCPMMP1.annot`
  * From Glasser et al. (2016)
  * A strong alternative candidate for consideration.
  * `?h.HCPMMP1_ORIG.annot` is OK
- `?h.power.annot`
  * From Power et al. (2011)
  * Not a preferred option for my taste (although, just in case, please find it in the fsaverage space)
  * This parcellation is highly non-uniform in parcel size; some areas are very small, while others cover large cortical surface regions (likely due to idiosyncratic data used, which may reflect their specific dataset but is suboptimal for exploring new data).

References

Dale, A. M., Fischl, B., & Sereno, M. I. (1999). Cortical Surface-Based Analysis. *NeuroImage*, *9*(2), 179–194. https://doi.org/10.1006/nimg.1998.0395 (cit. on p. 1)

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Ruuskanen, S., & Avendano-Diaz, J. C. (n.d.). Cortical functional connectivity across the adult lifespan and its relation to sensorimotor integration (cit. on pp. 1–2).