

Guide to choosing an FMRI dataset

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HCP task datasets

The HCP task datasets ([youtube-2021](#), [youtube-2020](#)) are a great overall choice, because many of the behaviors are interesting (gambling, emotion, language, social, working memory etc), and the data is already preprocessed and averaged across voxels to make brain regions. This dataset is appropriate for all levels.

Credit for data curation: John Murray, Saad Jbabdi

	Run	View
HCP 2021 + behavior	 Open in Colab	 nbviewer
HCP 2021	 Open in Colab	 nbviewer
HCP 2020	 Open in Colab	 nbviewer

References:



Barch, Deanna M., et al. "Function in the human connectome: task-fMRI and individual differences in behavior." Neuroimage 80 (2013): 169-189.

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FSL course task

The FSL course task dataset ([youtube](#)) complements the HCP one, with two additional language tasks. These data are brainwide and at the voxel level.

Credit for data curation: Saad Jbabdi



	Run	View
FSL course task	 Open in Colab	 nbviewer

References: none, this dataset only has one subject per task and was never used in a paper, just was used in another summer course

HCP retinotopy

HCP retinotopy ([youtube](#)) is a specific kind of project that can be used to do population receptive field modelling. This might be interesting to ML-savy groups because it doesn't require a lot of neuroscience or FMRI background, and one can visualize the hierarchy of brain areas and their responses.

Credit for data curation: Saad Jbabdi

	Run	View
HCP retinotopy	 Open in Colab	 nbviewer




References:

Benson, Noah C., et al. "The Human Connectome Project 7 Tesla retinotopy dataset: Description and population receptive field analysis." Journal of vision 18.13 (2018): 23-23.

Kay natural images

Credit for data curation: Michael Waskom, Marius Pachitariu

The Kay dataset ([youtube](#)) of visual responses to natural images is intermediate, as it has many voxels in V1/V2/V3/V4 and many images annotated with object label information.

	Run	View
Kay natural images	 Open in Colab	 

References:










Kay, Kendrick N., et al. "Identifying natural images from human brain activity." Nature 452.7185 (2008): 352-355.

Naselaris, Thomas, et al. "Bayesian reconstruction of natural images from human brain activity." Neuron 63.6 (2009): 902-915.

Bonner/Algonauts/Cichy

Bonner ([youtube](#)) / Cichy ([youtube](#)) / Algonauts ([youtube](#)) are the most advanced datasets which can be used to do representational (di)similarity analyses on visual response data (static images, videos, or navigation-related images). Specifically designed to go with the two project templates comparing FMRI responses to deep neural networks.

Credit for data curation: Kshitij Dwivedi

	Run	View
Bonner navigation	 Open in Colab	 
Cichy objects/animals	 Open in Colab	 
Algonauts video clips	 Open in Colab	 

References:

Kriegeskorte, Nikolaus, Marieke Mur, and Peter A. Bandettini. "Representational similarity analysis-connecting the branches of systems neuroscience." Frontiers in systems neuroscience 2 (2008): 4.

Bonner, Michael F., and Russell A. Epstein. "Coding of navigational affordances in the human visual system." Proceedings of the National Academy of Sciences 114.18 (2017): 4793-4798.

Cichy, Radoslaw Martin, Dimitrios Pantazis, and Aude Oliva. "Resolving human object recognition in space and time." Nature neuroscience 17.3 (2014): 455-462.

<http://algonauts.csail.mit.edu/challenge.html>