Some references for the MVPA EPOS course

Below some references that were covered during the lectures I gave. This is of course by no means a complete, or even a comprehensive list, these are just articles that I used to illustrate the history of EEG/MVPA and power of various multivariate approaches. For each article I very briefly explain why this paper is relevant.

Basics

- Fahrenfort, J. J., van Driel, J., van Gaal, S., & Olivers, C. N. L. (2018). From ERPs to MVPA Using the Amsterdam Decoding and Modeling Toolbox (ADAM). *Frontiers in Neuroscience*, *12*. http://doi.org/10.3389/fnins.2018.00368
  → *explains some MVPA concepts and covers the ADAM toolbox in detail*
- Grootswagers, T., Wardle, S. G., & Carlson, T. A. (2017). Decoding Dynamic Brain Patterns from Evoked Responses: A Tutorial on Multivariate Pattern Analysis Applied to Time Series Neuroimaging Data. *Journal of Cognitive Neuroscience*, *29*(4), 677–697. http://doi.org/10.1162/jocn_a_01068
  → *explains MVPA in the context of EEG and gives an overview of the effect of various preprocessing parameters on MVPA results*

Methods in MVPA

- Fahrenfort, J. J., Grubert, A., Olivers, C. N. L., & Eimer, M. (2017). Multivariate EEG analyses support high-resolution tracking of feature-based attentional selection. *Scientific Reports*, *7*(1), 1886. http://doi.org/10.1038/s41598-017-01911-0
  → *Demonstration of forward encoding models in EEG*
- King, J. R., & Dehaene, S. (2014). Characterizing the dynamics of mental representations: the temporal generalization method. *Trends in Cognitive Sciences*, *18*(4), 203–210. http://doi.org/10.1016/j.tics.2014.01.002
  → *Review and explanation of the temporal generalization method*
- Haufe, S., Meinecke, F., Goergen, K., Daehne, S., Haynes, J.-D., Blankertz, B., & Biessgmann, F. (2014). On the interpretation of weight vectors of linear models in multivariate neuroimaging. *NeuroImage*, *87*, 96–110. http://doi.org/10.1016/j.neuroimage.2013.10.067
  → *Paper describing how you can transform backward decoding weights into forward weights that are interpretable in terms of neural activity*
- Grootswagers, T., Cichy, R. M., & Carlson, T. A. (2018). Finding decodable information that can be read out in behaviour. *NeuroImage*, *179*, 252–262. http://doi.org/10.1016/j.neuroimage.2018.06.022
  → *Illustration of how the distance to the decision boundary in multivariate space can be used to link single trial brain measures to behavior (e.g. to reaction times or confidence)*
- Cichy, R. M., Pantazis, D., & Oliva, A. (2014). Resolving human object recognition in space and time. *Nature Neuroscience*, *17*(3), 455–462. http://doi.org/10.1038/nn.3635
  → *First illustration showing how one can use RDMs to map the high temporal resolution of EEG/MEG data onto the high spatial resolution of fMRI*

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History and context of EEG and MVPA

- La Vaque, T. J. (1999). The History of EEG Hans Berger. *Journal of Neurotherapy*, *3*(2), 1–9. http://doi.org/10.1300/J184v03n02_01
  → *recommended read, really nice story about the history of EEG / life of Hans Berger*
- Haxby, J. V., Gobbini, M. I., Furey, M. L., Ishai, A., Schouten, J. L., & Pietrini, P. (2001). Distributed and overlapping representations of faces and objects in ventral temporal cortex. *Science*, *293*(5539), 2425–2430. http://doi.org/10.1126/science.1063736
  → *one of the first convincing illustrations of the power of MVPA in fMRI*
- Kriegeskorte, N., Mur, M., Ruff, D. A., Kiani, R., Bodurka, J., Esteky, H., et al. (2008). Matching Categorical Object Representations in Inferior Temporal Cortex of Man and Monkey. *Neuron*, *60*(6), 1126–1141. http://doi.org/10.1016/J.Neuron.2008.10.043
  → *first illustration of mapping multivariate informational structures between species using RDMs*
- Cox, D. D., & Savoy, R. L. (2003). Functional magnetic resonance imaging (fMRI) "brain reading": detecting and classifying distributed patterns of fMRI activity in human visual cortex. *Neuroimage*, *19*(2 Pt 1), 261–270. http://doi.org/10.1016/S1053-8119(03)00049-1
  → *Explanation of linear and nonlinear separability in multivariate space*
- Peters, B. O., Pfurtscheller, G., & Flyvbjerg, H. (1998). Mining multi-channel EEG for its information content: an ANN-based method for a brain–computer interface. *Neural Networks*, *11*(7), 1429–1433. http://doi.org/10.1016/S0893-6080(98)00060-4
  → *Early illustration of the promise of multivariate methods in BCIs*

Multiple comparisons correction

- Maris, E., & Oostenveld, R. (2007). Nonparametric statistical testing of EEG- and MEG-data. *Journal of Neuroscience Methods*, *164*(1), 177–190. http://doi.org/10.1016/J.Jneumeth.2007.03.024
  → *Explanation of cluster-based permutation testing to correct for multiple comparisons*
- Benjamini, Y., & Hochberg, Y. (1995). Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. *Journal of the Royal Statistical Society. Series B (Methodological)*, *57*(1), 289–300. https://www.jstor.org/stable/2346101
  → *Explanation of FDR correction for multiple comparisons*