

W1 D3 – MODEL FITTING

Suggested further readings

Generic tips on model fitting in neuroscience:

Wilson, Robert C. & Collins, Anne. 2019. “Ten Simple Rules for the Computational Modeling of Behavioral Data.” *eLife* 8 (November). <https://doi.org/10.7554/eLife.49547>.

Palminteri, S., Wyart, V., & Koechlin, E. (2017, June 1). The Importance of Falsification in Computational Cognitive Modeling. *Trends in Cognitive Sciences*, Vol. 21, pp. 425–433. <https://doi.org/10.1016/j.tics.2017.03.011>

On linear regression:

Section 3.1 of Christopher Bishop’s textbook *Pattern recognition and machine learning*. Provides all mathematical derivations in depth. Freely available at <https://www.microsoft.com/en-us/research/people/cmbishop/>

Chapter 22 (Log-likelihood maximization) of David MacKay's very comprehensive textbook *Information Theory, Inference, and Learning Algorithms*. Freely available at <https://www.inference.org.uk/itprnn/book.pdf>

On model selection:

Chapter 28 (Model selection and Occam’s razor) of David MacKay's very comprehensive textbook *Information Theory, Inference, and Learning Algorithms*. Freely available at <https://www.inference.org.uk/itprnn/book.pdf>

Arlot, S., & Celisse, A. (2009). A survey of cross-validation procedures for model selection. *Statistics Surveys*, 4(0), 40–79. <https://doi.org/10.1214/09-SS054>

On optimization methods (for LLH maximization or MSE minimization):

Boyd, S. & Vandenberghe, L. - *Convex Optimization*. Textbook, great resource for convex optimization in general, available at <https://web.stanford.edu/~boyd/cvxbook/>

Acerbi, L., & Ma, W. J. (2017). *Practical Bayesian Optimization for Model Fitting with Bayesian Adaptive Direct Search*. NeurIPS 2017. Algorithm for optimization problems, with Matlab toolbox available at <https://github.com/lacerbi/bads>.

Research example developed in outro:

Wei, K., & Körding, K. (2009). Relevance of error: What drives motor adaptation? *Journal of Neurophysiology*, 101(2), 655–664. <https://doi.org/10.1152/jn.90545.2008>

