**Pre-lecture 3 readings: random matrix theory**

This week we start talking about random matrix theory, which forms the bulk of the latter part of the course.

The main reading for this week is sections of a book on RMT, by Livan et al., available online at

<https://arxiv.org/abs/1712.07903>. Each chapter is pretty short. Unlike last week, this week the problem set and readings are about equally important in learning the material.

**Readings**

**Introductory RMT**

Livan,

Chapter 1, introduces RMT

Chapter 2, spectra of random matrices

(corresponds to the ‘avoided crossings’ problem in the homework)

Chapter 3, introduction to some random matrix ensembles

(corresponds to the ‘GOE’ problem in the homework)

**Matrix Jacobians and diagonalization**

[*Random Matrix Theory*](https://web.eecs.umich.edu/~rajnrao/Acta05rmt.pdf) *by* Edelman and Rao (Vandermonde determinant),

Section 3, on matrix Jacobians

OR

Livan,

Chapters 6 and 7

**Applications of RMT (optional)**

[*Random Matrix theory and its Innovative Applications*](http://math.mit.edu/~edelman/publications/random_matrix_theory_innovative.pdf)by Alan Edelman and Yuyang Wang