HH/PSYC 6229 3.0 A
Statistical modelling of perception and cognition
Winter 2019

Instructor: Richard Murray rfm@yorku.ca

Lectures: Tuesdays, 11:30 - 2:30 pm, DB 2027

Website: www.yorku.ca/rfm/psyc6229

Textbook: Jones, Maillardet, & Robinson (2014), Scientific programming and simulation using R, second edition.

Evaluation: six tests (10%), two problem sets (40%), term project (50%)

Overview. This course covers fundamental statistical concepts and their application to statistical modelling in psychology. Topics in statistical foundations include probability, random variables, common statistical distributions, and Bayes' theorem. To illustrate these concepts we cover classic statistical models of behaviour and physiology, such as signal detection theory, optimal cue combination, diffusion models of reaction times, probability summation, and ideal observers. We also discuss model fitting and testing, e.g., parameter estimation, bootstrapping, goodness of fit, and model selection. The course uses R, a statistical programming language, for illustrations and problems.

Some useful references:

- Venables et al. (2014), An introduction to R. (free PDF from R website)

- Knoblauch & Maloney (2014), Modelling psychophysical data in R. (free PDF through the York Library)

LECTURE SCHEDULE

		topic	tests etc.
1	8-Jan	probability; programming in R	
2	15-Jan	probability; programming in R	test 1
3	22-Jan	elements of calculus; random variables	
4	29-Jan	probability; programming in R	test 2; proposal
5	5-Feb	signal detection theory	
6	12-Feb	prospect theory	test 3
	19-Feb	*reading week; no class*	
7	26-Feb	cue combination	problem set 1
8	5-Mar	maximum likelihood methods	test 4
9	12-Mar	the general linear model	
10	19-Mar	ideal observers	test 5
11	26-Mar	model fitting and testing	
12	2-Apr	the generalized linear model	problem set 2; test 6

The term project is due on Thursday, April 9.

Guidelines on plagiarism. An important part of learning how to solve problems and write code is discussing the problems with other people, and reading other peoples' code. This makes it important to think about what constitutes plagiarism. Here are some guidelines. You can discuss assigned problems with others as much as you want, and read each others' code, but in the end you must do your own work. If you cut and paste someone else's code, you are plagiarizing. If you find yourself looking at someone else's solutions or code while writing your own, you are probably plagiarizing. If you memorize someone else's problems or code and type them in without understanding them, you are plagiarizing. It is important that you provide your own solutions to assigned problems. That said, discussions are an important part of solving difficult problems, and it is inevitable and acceptable that different peoples' solutions will end up being similar in some ways.