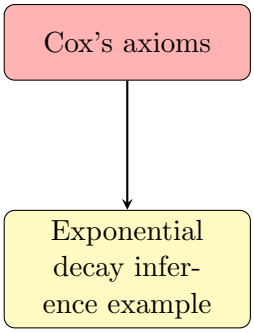
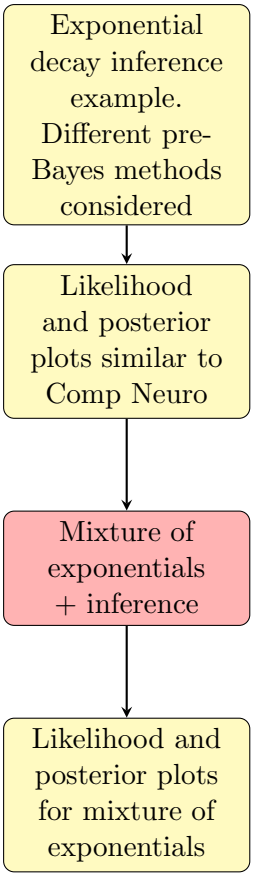
# 1 Intro to Bayesian Inference

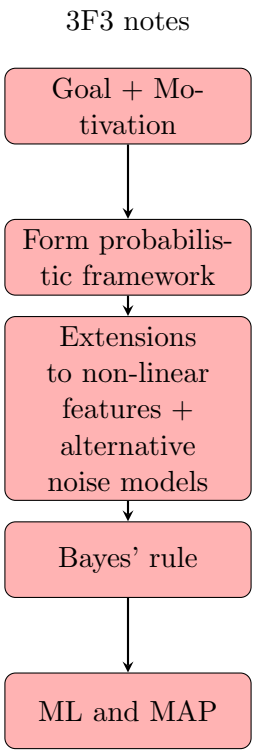
Rich Turner Computational Neuroscience notes



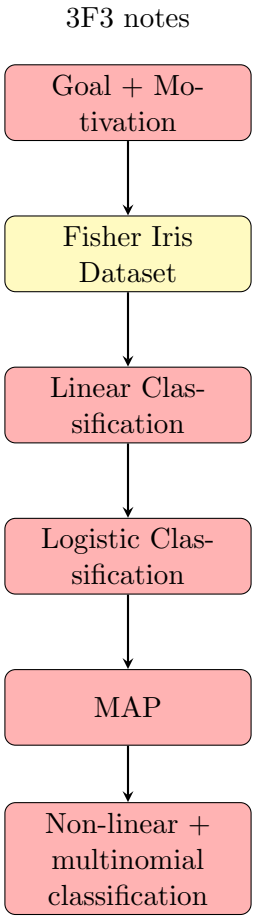

David Mackay: Intro to Bayesian Inference (II)



## 2 Regression

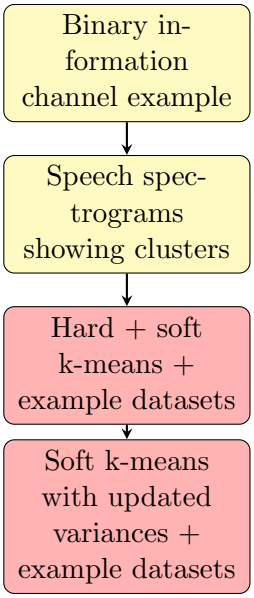


# 3 Classification

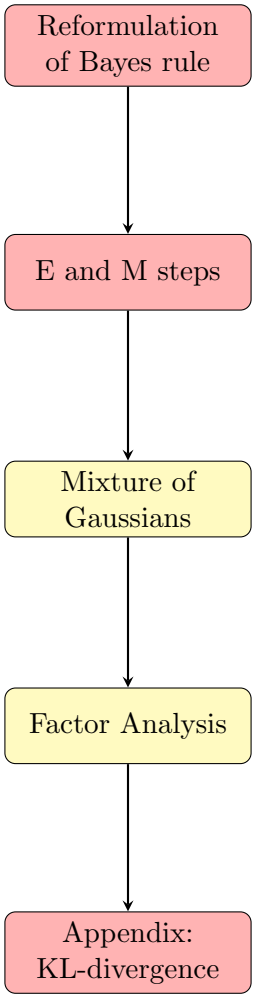


# 4 EM

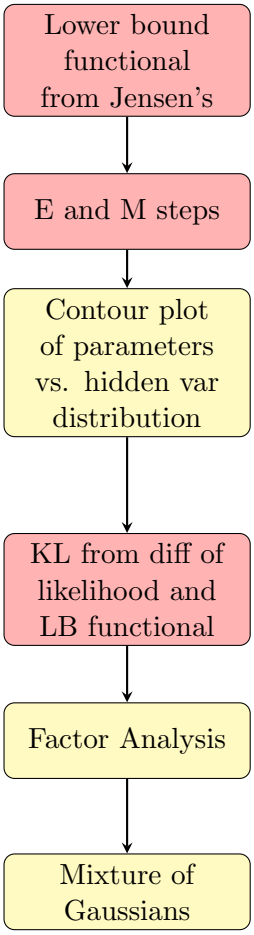
Mackay: Approximating Probability Distributions (I)




Rasmussen - 4F13

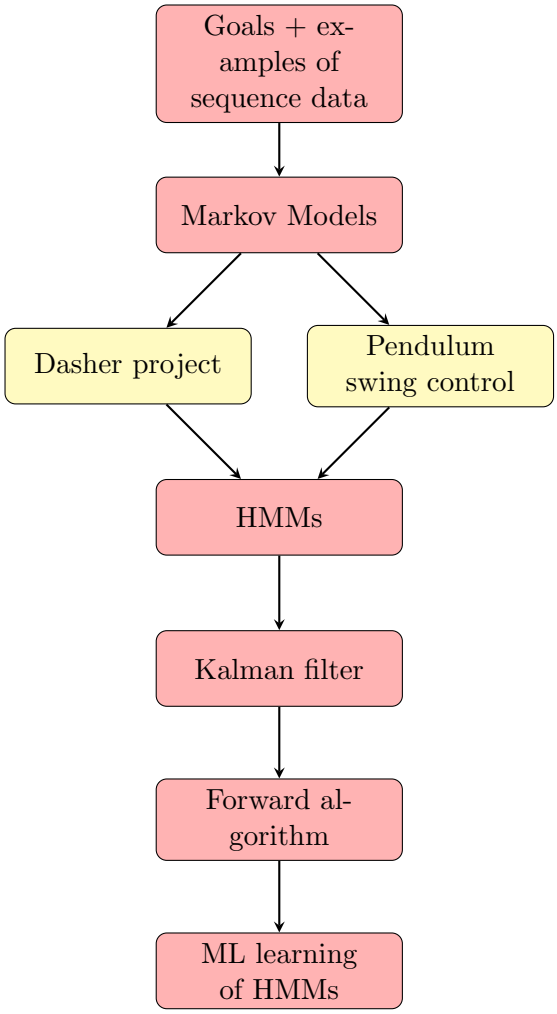



4F13 - 07/08

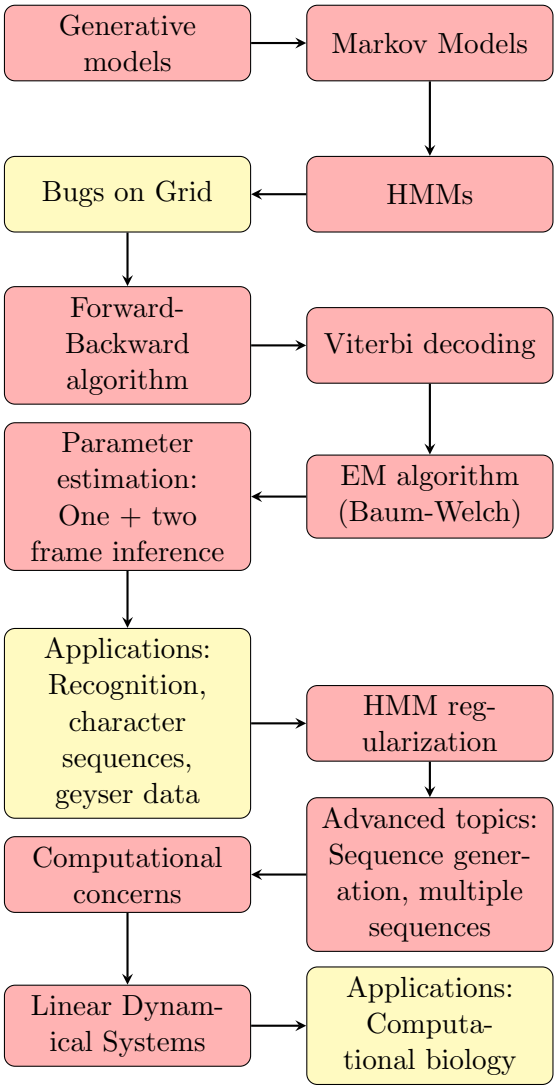


# 5 Sequence modelling

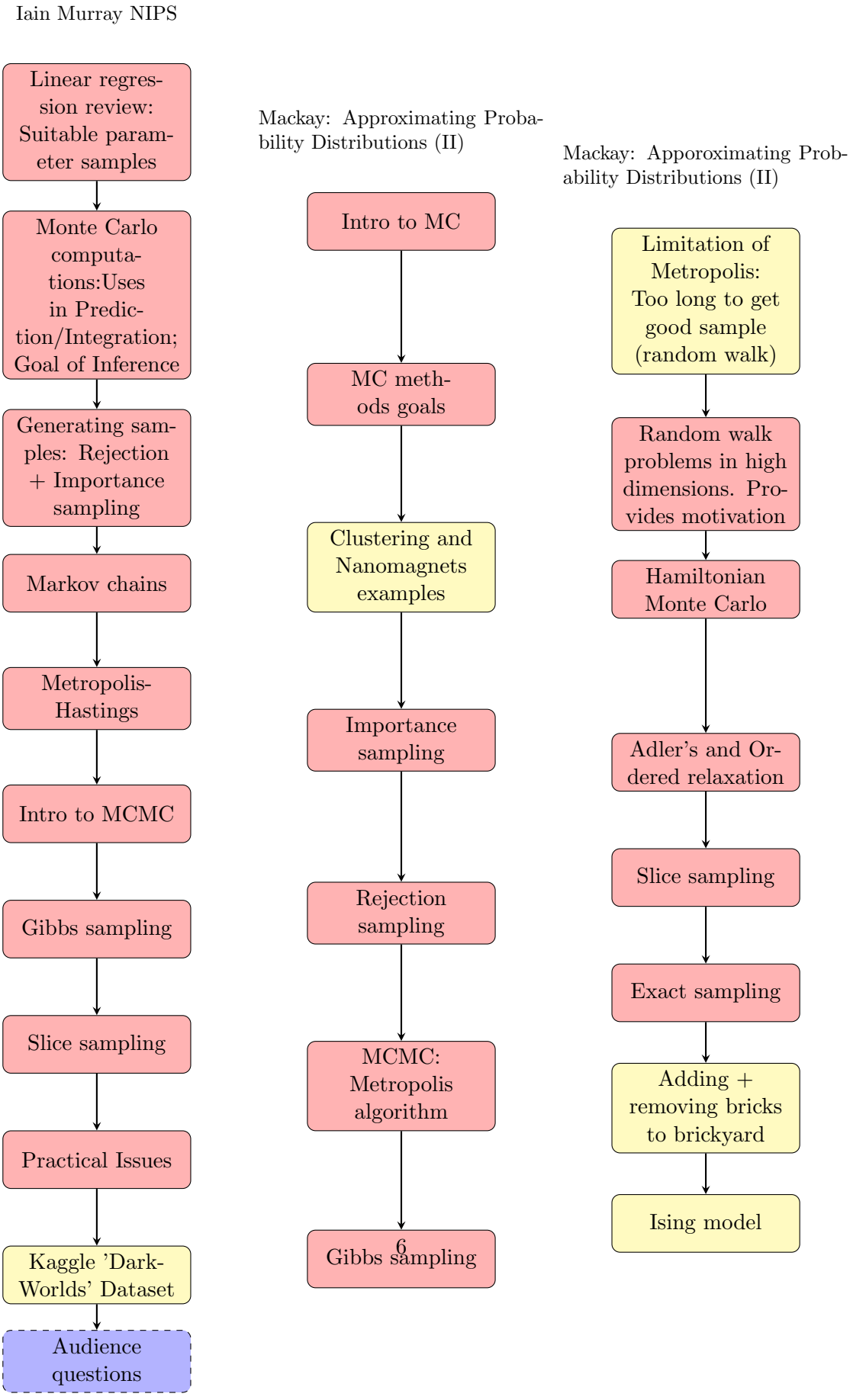
Turner notes

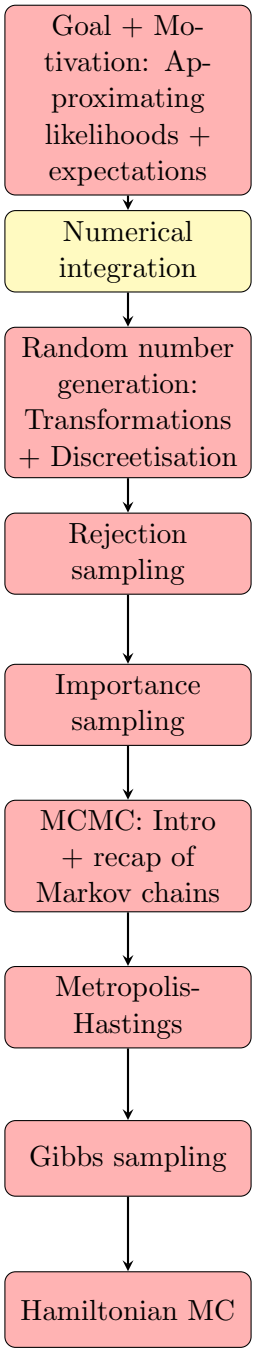



Sam Roweis notes



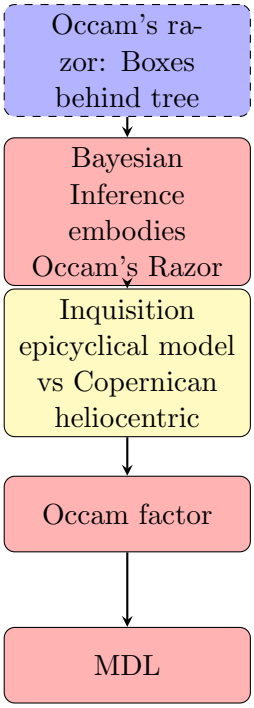
# 6 MCMC

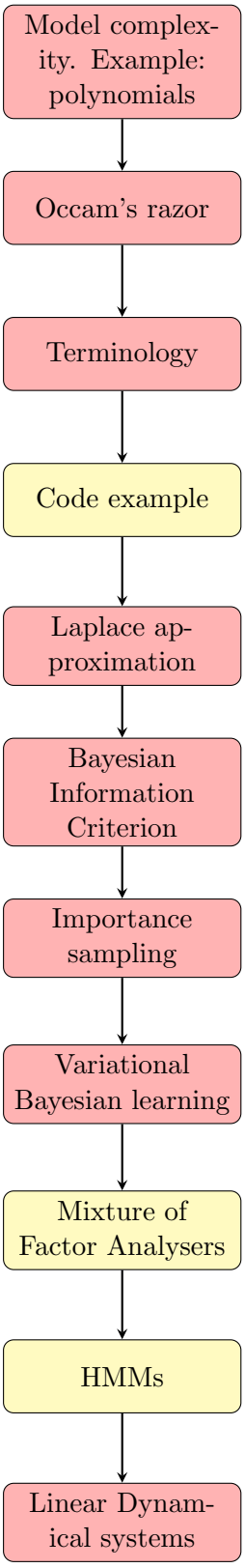

Iain Murray NIPS
Linear regression review: Suitable parameter samples
Monte Carlo computations:Uses in Prediction/Integration; Goal of Inference
Generating samples: Rejection + Importance sampling
Markov chains
Metropolis-Hastings
Intro to MCMC
Gibbs sampling
Slice sampling
Practical Issues
Kaggle 'Dark-Worlds' Dataset
Audience questions
Mackay: Approximating Probability Distributions (II)
Intro to MC
MC methods goals
Clustering and Nanomagnets examples
Importance sampling
Rejection sampling
MCMC: Metropolis algorithm
Gibbs sampling
Mackay: Apporoximating Probability Distributions (II)
Limitation of Metropolis: Too long to get good sample (random walk)
Random walk problems in high dimensions. Provides motivation
Hamiltonian Monte Carlo
Adler's and Ordered relaxation
Slice sampling
Exact sampling
Adding + removing bricks to brickyard
Ising model




# 7 Model comparison

Mackay book




4F13 - 07/08