Dynamical Systems, Stochastic Processes and Bayesian Inference

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Main focus of the workshop

Stochastic differential equations:

$$d\mathbf{x} = \mathbf{f}(\mathbf{x}, t)\, dt + \sqrt{\boldsymbol{\Sigma}}\, d\mathbf{W}(t)$$

- Latent states and continuous in time
- Drift & diffusion
- Non-Gaussian processes (intractable)
- Bayesian inference (observations)
- Machine learning approach
- Fokker-Planck equations, transition probability and path integral

Some important questions…

- Stochasticity vs. randomness
- What do we gain by modeling continuous time processes?
- Can we learn stochastic noise and observation noise simultaneously?
- Scalability?
- …

Further info…

- Program:

  http://www.cs.ucl.ac.uk/staff/C.Archambeau/dsb.htm

- Reviewers:

  - Organizers
  - Dan Cornford (Aston University)
  - Magnus Rattray (Univesity of Manchester)

- Sponsor: