



Department of Automatic Control & Systems Engineering
would like to announce the following seminar:

Drosophila Dynamics

Speaker: **Dr Michael Dewar**

**School of Informatics
The University of Edinburgh**

**Monday 13 July 2009
at 14:10**

Location: Sir Henry Stephenson Building LT2

Tea and Biscuits will be served afterwards.

ABSTRACT

The study of animal behaviour is important as it gives us an insight into the neuronal circuitry of animal. When we perturb the neuronal circuitry, through changes to the animal's genotype or application of a compound, we view the result as a change in behaviour. Some of these changes can be quite dramatic, for example the loss or gain of a behavioural component, or they might be quite subtle, such as a change in the order of the expressed behaviours. We would like to be able to identify these changes automatically, using video data.

This talk will describe a possible approach to this problem, based on switching dynamical systems. I will focus on the problem of extracting behavioural information from videos of courting pairs of *Drosophila melanogaster* (a small fly popular for studying genetics). By modelling the individual components of the flies' behaviour using autoregressive models, then linking them together using a type of hidden Markov model, we are able to infer the hidden 'motivation' of the fly.

I will use this example to put forward the argument that the emerging field of 'ethomics' should be based on representational models of behaviour, rather than the more typical data-mining techniques. Using dynamic models in this way gives us both a clear set of modelling assumptions as well as a set of powerful tools which can be brought to bear on the analysis of behaviour.