

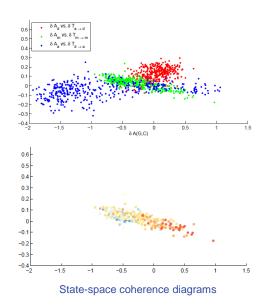
## **Complex Systems in Robotics**

Oliver M. Cliff

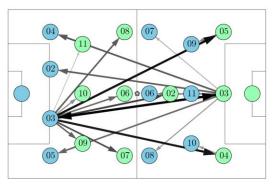
## **Classifying dynamics**



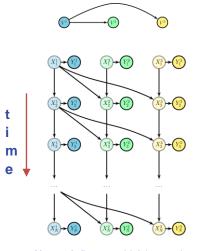
RoboCup 2D simulation trace diagram



## **Complex networks**



Pairwise (separable) interactions

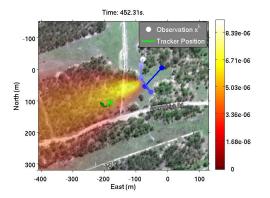


Network (inseparable) interactions

## **Environmental modelling**



**UAV system in flight**. Inset: radio-tagged *Manorina Melanocephala* localized in these experiments.



**Localizing a live bird.** Estimated tracks of the bird in green and UAV in blue. The grid-based posterior (heat colormap) converges over time to an estimate of the position.