

Possible CDT projects

Chris Williams

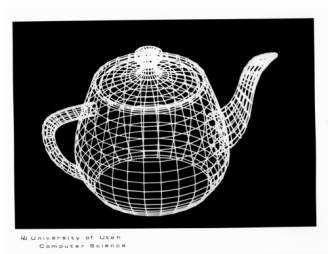
Institute for Adaptive and Neural Computation
School of Informatics, University of Edinburgh, UK

October 2014

Possible areas

- ▶ Vision as Inverse Graphics
- ▶ Condition Monitoring in Intensive Care Units
- ▶ Other topics in probabilistic machine learning

Vision as Inverse Graphics

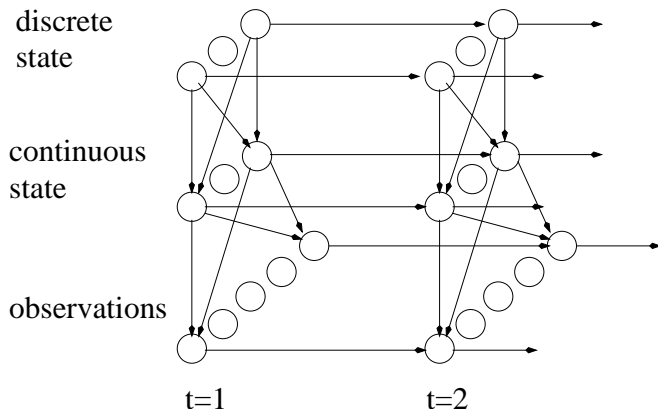


- ▶ It is hard to get rich, annotated image data of object classes
- ▶ Key idea: build a computer graphics stochastic scene generator that models the variability in object *classes*
- ▶ Key advantage: large numbers of images and associated ground truth can be generated
- ▶ Microsoft studentship

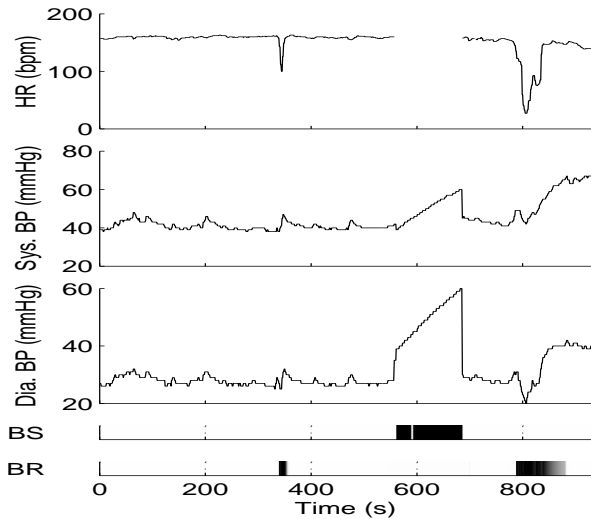
Issues:

- ▶ Building a stochastic scene generator (graphics): model object shape and appearance variability, object co-occurrences and relationships
- ▶ Inference: recognition networks to infer object identities, poses, illumination etc

Condition Monitoring in Intensive Care Units



Quinn, Williams, McIntosh (2009)



Developing this model

- ▶ Working with Neurological ICU, Southern General Hospital, Glasgow
 - ▶ Modelling control inputs, e.g. drug pumps, ventilator settings
- ▶ Working with Neonatal ICU, Royal Infirmary of Edinburgh
 - ▶ Modelling sepsis. Work so far compares proven sepsis with controls, but there is more to do wrt intermediate diagnoses (“mixed growth”)
- ▶ Possible work on applications to power grid systems