

Learning Bayesian Networks Seminar Series

CSIRO Davies Laboratory

Seminar 1: Introduction to Bayesian Networks

When: Wednesday, 14 March, 12:00 – 1:30 pm

Where: Seminar Room

Reservation: Not required

Description: The notion of Bayesian Probability. Frequentist versus Bayesian probability. The role of Bayesian inference. Bayesian inference and causality. Conditional independence. Bayesian probability versus likelihood. Probability distributions. Bayesian belief and decision networks (BBN, BDN). Conditional probability elicitation, utility and evaluation. Modeling Bayesian Networks. Basic elements of graph theory and network topology. Applications of Bayesian networks to natural, social and economic sciences. Important assumptions and methodological caveats.

Seminar 2: Introduction to Netica

When: Friday, 13 April, 1:30 – 3:30 pm

Where: Seminar Room

Reservation: Required; contact Kostas to reserve space (16 spaces available)

Description: Introduction to Netica. Constructing a BBN and BDN with Netica. Basic functions and features. Types of nodes and their properties. Generating conditional probability tables (CPTs). Likelihood and likelihood relations. Fading. Explaining away. Compiling a network. Examining the results and generating reports. Working with cases and case ensembles. Training a network using case files. Monte Carlo simulations using Bayesian inference. Learning in Bayesian Networks. Learning algorithms. The expectation maximization algorithm (EM). Gradient learning algorithm. Additional features. Interactive tutorial.

Seminar 3: Advanced Bayesian Inference

When: Thursday, 31 May, 12:00 – 1:30 pm

Where: Seminar Room

Reservation: Not required.

Description: Beyond simple probabilistic inference. The role of causal inference. Statistical properties of probabilistic inference. Diagnostic versus predictive inference. Equation modeling with Netica. Probabilistic distribution modeling. Bayesian parameter estimation. Programming with Netica. Participatory and Adaptive Bayesian networks. Statistical aspects of Bayesian learning algorithms. Topics in Bayesian Artificial Intelligence. Advanced Bayesian Reasoning.

* For more information and space reservation on the tutorial seminar, contact Kostas Alexandridis or Alex Kutt.