"Learning without search"

**Professor Geoff Webb**  
Director, Centre for Research in Intelligent Systems, Monash University

**Time** 11.00am - 12.00pm  
**Date** 19 October 2010  
**Venue** N54 2.06 Nathan Campus Griffith University  
videolink will be available G34 1.04 Gold Coast campus Griffith University.

**Abstract:** Machine learning is classically conceived as search through a hypothesis space for a hypothesis that best fits the training data. In contrast, na"ive Bayes performs no search, extrapolating an estimate of a high-order conditional probability by composition from lower-order conditional probabilities. In this talk I show how this searchless approach can be generalised, creating a family of learners that provide a principled method for controlling the bias/variance trade-off. At one extreme very low variance can be achieved as appropriate for small data. Bias can be decreased with larger data in a manner that ensure Bayes optimal asymptotic error. These algorithms have the desirable properties of

- training time that is linear with respect to training set size,
- supporting parallel and anytime classification,
- allowing incremental learning,
- providing direct prediction of class probabilities,
- supporting direct handling of missing values, and
- robust handling of noise.

Despite being generative, they deliver classification accuracy competitive with state-of-the-art discriminative techniques.

**Bio:** Geoff Webb is a Professor of Information Technology Research at Monash University, where he heads the Centre for Research in Intelligent Systems. Prior to Monash he held appointments at Griffith University and then Deakin University, where he received a personal chair. His primary research areas are machine learning, data mining, and user modelling. His commercial data mining software, Magnum Opus, incorporates many techniques from his association discovery research. Many of his learning algorithms are included in the widely-used Weka machine learning workbench. He is editor-in-chief of the highest impact data mining journal, Data Mining and Knowledge Discovery, co-editor of the Encyclopedia of Machine Learning (to be published by Springer), a member of the advisory board of Statistical Analysis and Data Mining and a member of the editorial boards of Machine Learning and ACM Transactions on Knowledge Discovery in Data.

RSVP to Seminar Coordinator  *Natalie Dunstan* for catering purposes. Cost: Free Lecture, Telephone: (07) 37353757, Email: n.dunstan@griffith.edu.au