Something Old, Something New, Something Borrowed, Something Blue

By: Prof. Wray Buntine
Monash University

Abstract

Something Old: In this talk I will first describe some of our recent work with hierarchical probabilistic models that are not deep neural networks. Nevertheless, these are currently among the state of the art in classification and in topic modelling: k-dependence Bayesian networks and hierarchical topic models, respectively, and both are deep models in a different sense. These represent some of the leading edge machine learning technology prior to the advent of deep neural networks. Something New: On deep neural networks, I will describe as a point of comparison some of the state of the art applications I am familiar with: multi-task learning, document classification, and learning to learn. These build on the RNNs widely used in semi-structured learning. The old and the new are remarkably different. So what are the new capabilities deep neural networks have yielded? Do we even need the old technology? What can we do next? Something Borrowed: to complete the story, I'll introduce some efforts to combine the two approaches, borrowing from earlier work in statistics.

Biography

Professor Wray Buntine is Australia's foremost scholar for the statistical analysis of documents and related structured content and their predictive modelling. He has a global reputation for having consistently established research techniques over several decades that define the state of the art in machine learning. He has developed and led major research projects in the UK and Europe in predictive modelling and document analysis, and consulted for numerous national academic funding bodies as well as being a senior representative for top rated international conferences and editorial boards. His team at Monash develops world class document summary systems. In San Francisco Bay Area in the 90's he also worked on a series of start-ups as well as at major research laboratories such as NASA, Google and UC Berkeley. His unique skillset is in the development of document analysis systems based on state of the art machine learning methods integrating the use of natural language and information retrieval techniques. Areas where he has established major international research directions are ensembling, Bayesian model averaging, statistical relational learning, probabilistic graphical models, topic models, and computational non-parametric methods.