

Invited Talk: Backoff methods for estimating parameters of a Bayesian network

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Abstract

Various authors have highlighted inadequacies of BDeu type scores and this problem is shared in parameter estimation. Basically, Laplace estimates work poorly, at least because setting the prior concentration is challenging. In 1997, Friedman et al suggested a simple backoff approach for Bayesian network classifiers (BNCs). Backoff methods dominate in n-gram language models, with modified Kneser-Ney smoothing, being the best known, and a Bayesian variant exists in the form of Pitman-Yor process language models from Teh in 2006. In this talk we will present some results on using backoff methods for Bayesian network classifiers and Bayesian networks generally. For BNCs at least, the improvements are dramatic and alleviate some of the issues of choosing too dense a network.

Biography

Wray Buntine is a full professor at Monash University in February 2014 after 7 years at NICTA in Canberra Australia. At Monash he is director of the Master of Data Science, the Faculty of IT's newest and in-demand degree, and was founding director of the innovative (online) Graduate Diploma of Data Science. He was previously at NICTA (Australia), Helsinki Institute for Information Technology, NASA Ames Research Center, University of California, Berkeley, and Google. He is known for his theoretical and applied work and in probabilistic methods for document and text analysis, social networks, data mining and machine learning. His recent focus has been with non-parametric methods in these areas. He has acted as programme co-chair of ECML-PKDD in 2009 in Bled, Slovenia, programme co-chair of ACML in Singapore in 2012 and programme chair in Canberra in 2013. He reviews for conferences such as ACML, ECIR, ECML-PKDD, ICML, NIPS, UAI, and KDD, and is on the editorial board of Data Mining and Knowledge Discovery.