

Building Bayesian Influence Ontologies Annotated Bibliography

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References

- [1] R. Ajoodha and B. Rosman, “Tracking influence between naïve bayes models using score-based structure learning,” in *2017 Pattern Recognition Association of South Africa and Robotics and Mechatronics (PRASA-RobMech)*. IEEE, November 2017.

Aim: To present a method that learns the high-level influence structure present between a set of independently learned naïve Bayes models.

Summary: This paper presents an algorithm for learning the influence structure between naïve Bayes models (NBMs). The algorithm achieves this by first learning a set of independent NBMs (i). It then computes a score used to evaluate the fitness of the network (ii). This approach makes use of a modified Bayesian information criterion (BIC) for scoring, which provides an acceptable trade-off between model complexity and data fitting. The algorithm then refines the model given the new influence structure using expectation maximisation (iii). After this, the candidate network is subjected to a graph operation (edge addition, reversal or deletion) chosen to improve the network’s score (iv). This is achieved using a greedy hill-climbing heuristic, which guarantees monotonically improving score between iterations. Finally, steps (ii) to (iv) are repeated until an optimum is found. The result is a method which, in the authors’ tests achieved 60-82%. Additionally, the method outperformed the random structure and the structure with no conditional independence assertions, and tended towards the true structure as number of samples increased.