

Relevance Networks for Cold Start Inference of User Preferences

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INTRODUCTION

In this work we take a novel hybrid approach to recommending preferences [1], which exploits the intuition that discovered and learned semantic relevance between terms is a good proxy for associated user preferences.

We model relationships between possible preferences with a Bayesian Network. In the case where evidence from user data is sparse, the structure of the Bayesian Network and initialization of the conditional probability tables cannot be learned from data.

We describe how we make use of a user-trained Neural Network model of the relevance between terms in a given domain, initialized using mining unstructured text data shown in Figure 1, to determine the structure and initialize the conditional probability tables of a Bayesian Network for recommending preferences.

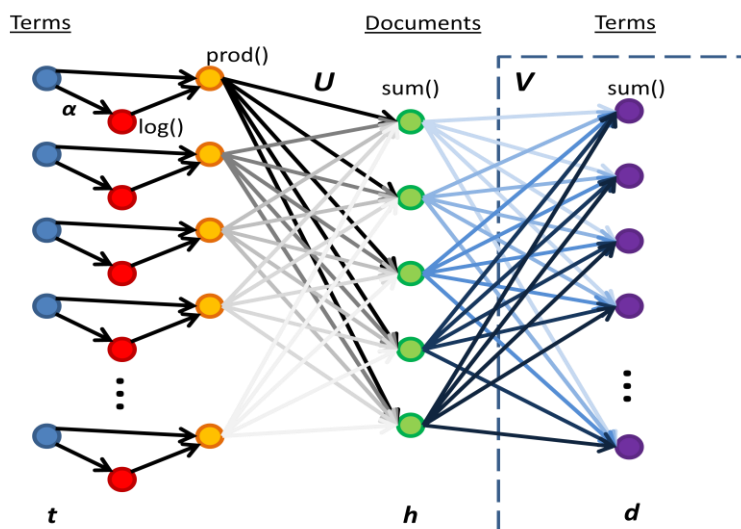


Figure 1 - Term-relevance Neural Network Model

We demonstrate the performance of the approach using a dataset derived from the Netflix[2] movie ratings dataset and Wikipedia[3]; finding that with no more than 10 ratings (accounting for approximately half of the movie ratings dataset), it is possible to achieve well in excess of 50% relative lift over random using this technique. Further, we demonstrate the use of Bayesian model averaging to combine this approach with a second user-evidence based Bayesian Network model to enable a model that performs optimally across situations with patches of significant user data.

1. REFERENCES

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