

Applying Neural Networks for Solving Record Linkage Problem via Fuzzy Description Logics

Authors : Mikheil Kalmakhelidze

Abstract : Record linkage (RL) problem has become more and more important in recent years due to the growing interest towards big data analysis. The problem can be formulated in a very simple way: Given two entries a and b of a database, decide whether they represent the same object or not. There are two classical deterministic and probabilistic ways of solving the RL problem. Using simple Bayes classifier in many cases produces useful results but sometimes they show to be poor. In recent years several successful approaches have been made towards solving specific RL problems by neural network algorithms including single layer perception, multilayer back propagation network etc. In our work, we model the RL problem for specific dataset of student applications in fuzzy description logic (FDL) where linkage of specific pair (a,b) depends on the truth value of corresponding formula $A(a,b)$ in a canonical FDL model. As a main result, we build neural network for deciding truth value of FDL formulas in a canonical model and thus link RL problem to machine learning. We apply the approach to dataset with 10000 entries and also compare to classical RL solving approaches. The results show to be more accurate than standard probabilistic approach.

Keywords : description logic, fuzzy logic, neural networks, record linkage

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