Title: Rule induction

URL: https://en.wikipedia.org/wiki/Rule_induction

PageID: 7517319

Categories: Category:Inductive reasoning, Category:Machine learning, Category:Machine learning stubs

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Rule induction is an area of machine learning in which formal rules are extracted from a set of observations. The rules extracted may represent a full scientific model of the data, or merely represent local patterns in the data.

Data mining in general and rule induction in detail are trying to create algorithms without human programming but with analyzing existing data structures. [1] : 415- In the easiest case, a rule is expressed with “if-then statements” and was created with the ID3 algorithm for decision tree learning. [2] : 7 [1] : 348 Rule learning algorithm are taking training data as input and creating rules by partitioning the table with cluster analysis . [2] : 7 A possible alternative over the ID3 algorithm is genetic programming which evolves a program until it fits to the data. [3] : 2

Creating different algorithm and testing them with input data can be realized in the WEKA software. [3] : 125 Additional tools are machine learning libraries for Python , like scikit-learn .

Paradigms

Some major rule induction paradigms are:

Association rule learning algorithms (e.g., Agrawal)

Decision rule algorithms (e.g., Quinlan 1987)

Hypothesis testing algorithms (e.g., RULEX)

Horn clause induction

Version spaces

Rough set rules

Inductive Logic Programming

Boolean decomposition (Feldman)

Algorithms

Some rule induction algorithms are:

Charade [4]

Rulex

Progol

CN2

References

Quinlan, J. R. (1987). "Generating production rules from decision trees" (PDF) . In McDermott, John (ed.). Proceedings of the Tenth International Joint Conference on Artificial Intelligence (IJCAI-87) . Milan, Italy. pp. 304– 307.

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