Discovering Associative Patterns in Health Care Data

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Planning

Identify studies that use membership rules applied to medical data.

PICOC

- **Population:** Studies applying classical or customized association rule techniques to medical or clinical data
- **Intervention:** Algorithms used and evaluation techniques
- **Comparison:** List of exploratory analysis articles used to evolve keywords
- **Outcome:** Deep and comprehensive view of evaluation algorithms and techniques in the process of generating association rules in medical data and clinical data
- **Context:** Researchers using medical and clinical data to identify patterns of associated characteristics

Research Questions

1. What algorithms for generating binding rules were used?
2. What metrics and techniques were employed to evaluate the rules of association in medical data?
3. Main problems in the process of generating association rules in medical data?

Keywords and Synonyms

Keyword; Association mining; Association Rules; Association rules mining; clinical; Medical; Medical Data Mining

Search String

(("Association rules") OR ("Association mining") OR ("Association rules mining") AND (("medical") OR ("clinical") OR ("Medical Data Mining")) NOT (("prediction") OR ("classification")))

Sources

- ACM Digital Library (http://portal.acm.org)
- Google Acadêmico (https://scholar.google.com.br)
- IEEE Digital Library (http://ieeexplore.ieee.org)
- PubMed (https://www.ncbi.nlm.nih.gov/pubmed)
- Science@Direct (http://www.sciencedirect.com)
- Springer Link (http://link.springer.com)

Selection Criteria

Inclusion Criteria:

1. Direct application in medical data
2. Association rules algorithms Application

Exclusion Criteria:

1. Abstract without results and methodology
2. Articles published in low-impact locations
3. Articles that did not use membership rules as the primary technique
4. Theoretical-only articles, without applying in a Data set
5. Out of scope
6. Not Accessible

Quality Assessment Checklist

Questions:

1. Abstract with results and methodology
2. Graphics
3. Application in data (real or synthetic)
4. Data set availability
5. Applied solution availability
6. Impact factor greater than 3
7. With QUALIS A

Answers:

- Yes
- Partially
- No

Data Extraction Form

1. What association rules algorithms was used?
2. Classic Algorithms of Literature?
3. Did you use Another MD or ML Algorithm in conjunction with the Membership Rules algorithm?
4. Real or Synthetical Database?
5. Number of Attributes?
6. Number of Records?
7. The number of Association Rules Generated?
8. How was the Best Rules Assessment carried out?
9. What Metrics Have Been Used to Choose the Best Rules
10. Main Problems Found in the Study?
11. Future Works Pointed by the author?

Conducting

Digital Libraries Search Strings

ACM Digital Library:

acmdlTitle:("Medical" "clinical" "Medical Data Mining" "diagnosis" "exams" "Data Mining" "symptoms" "medicines") AND recordAbstract:("Association Rules" "Association mining" "Association rules mining" -"classification" -"prediction") AND keywords.author.keyword:(-"classification" -"prediction")

Google Scholar:

Title, abstract, keywords: "medical data mining" "Association rules" "Association rules" OR "Association mining" OR "Association rules mining" OR "medical data mining" OR "medical" OR "clinical" -prediction -classification

IEEE Digital Library:

((((((((((("Publication Title":"association rules") OR "Publication Title":"Association mining") OR "Publication Title":"Association rules mining") OR "Publication Title":"Medical Data Mining") AND "Abstract":"medical") OR "Abstract":"clinical") OR "Abstract":"Medical Data Mining") AND "Abstract":"association rules") OR "Abstract":"Medical Data Mining") OR "Abstract":"Association rules mining") NOT "Publication Title":"prediction" NOT "Publication Title":"classification")

PubMed:

("medical data mining"[Title/Abstract]) AND "association mining"[Title/Abstract] OR "Association Rules"[Title/Abstract] OR "Association rules mining"[Title/Abstract]

((("association mining"[Title/Abstract]) OR "Association Rules"[Title/Abstract]) OR "Association rules mining"[Title/Abstract]) AND "application"[Title/Abstract]

"Association Rules Mining"[Title/Abstract]

Science@Direct:

(("Association rules") OR ("Association mining") OR ("Association rules mining") AND

((''medical'') OR (''clinical'') OR (''Medical Data Mining'')) NOT ((''prediction'') OR (''classification'')))

Springer Link:

''Association rules mining'' OR ''Association rules'' OR ''Association mining'' AND (''medical'' OR ''clinical'' OR ''Medical Data Mining'') AND NOT (''prediction'' AND OR AND ''classification'')

Imported Studies

- **ACM Digital Library:** 20
- **Google Acadêmico:** 30
- **IEEE Digital Library:** 105
- **PubMed:** 215
- **Science@Direct:** 47
- **Springer Link:** 180

Studies