PAPER REVIEW
S. O. Kuznetsov: Galois connections in data analysis:

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INVESTMENTS IN EDUCATION DEVELOPMENT
Basic Information


– Provides (generally not known) information about the research conducted in the former Soviet Union and, later, in Russia in Galois connections and their applications in data analysis, but also in other methods of relational data analysis.

– In particular, the research conducted in the 1970s and 1980s at VINITI (Soviet research institute) is surveyed.
Key concepts involved:

- Galois connections, formal concept analysis,
- taxonomy,
- lattices,
- similarity and tolerance relations,
- hypotheses, inductive reasoning,
- JSM method,
- classification,
- pattern structures,
- decision trees, information gain,
- version space.

- The past research is looked at through the lens of formal concept analysis.

- Valuable, written by an eye-witness and participant in the research described.
Content

Introduction
- research at VINITI
- motivations and applications
- NTI journal as publication venue
- Y. A. Shreider
- document classification problem
- lattice theoretical framework
- implications
- taxonomies and meronomies
Taxonomies and dependencies

- taxonomies and their need
- object-attribute data and concept lattices
- notions related to clustering
- Moore family, product of taxonomies
- many-valued attributes
- scaling
- dependencies
- functional dependencies and database notions
Tolerance relation: symmetric context
- literature on early tolerance research
- tolerance as similarity
- tolerance classes, preclasses, Galois connections
- representation of similarity
- global similarity
- local similarity
- representation results
JSM Method

- V. Finn
- J. S. Mill’s work
- method of difference, method of agreement
- formalization (paper get rather unclear here)
- formalization using FCA
- positive and negative hypotheses
- classification
- examples
- specific hypotheses
- similarity
- pattern structures and motivations for them
Machine learning and decision trees

- basic notions
- decision paths
- irredundancy
- representation theorems
- version spaces and concept-based hypotheses
- theorems
Paper References

- References contain 98 bibliographic items.

- Most of them are by Soviet/Russian authors and were published in Soviet/Russian journals.
Further Reading

- ref 1

  http://www.archive.org/details/asystemoflogic01milluoft,
  http://www.archive.org/details/asystemoflogic02milluoft