

The background features a complex, abstract design. It includes a network of thin, light-colored lines forming a web-like structure. Overlaid on this are various data visualizations: a grid of small, light-colored squares on the left, a series of small, light-colored circles on the right, and a central area with a grid of small, light-colored squares. The overall color palette is muted, with shades of brown, beige, and light blue.

Mining Multi-Dimensional Associations

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- ❑ Single-dimensional rules (e.g., items are all in “product” dimension)
 - ❑ $\text{buys}(X, \text{“milk”}) \Rightarrow \text{buys}(X, \text{“bread”})$
- ❑ Multi-dimensional rules (i.e., items in ≥ 2 dimensions or predicates)
 - ❑ Inter-dimension association rules (*no repeated predicates*)
 - ❑ $\text{age}(X, \text{“18-25”}) \wedge \text{occupation}(X, \text{“student”}) \Rightarrow \text{buys}(X, \text{“coke”})$
 - ❑ Hybrid-dimension association rules (*repeated predicates*)
 - ❑ $\text{age}(X, \text{“18-25”}) \wedge \text{buys}(X, \text{“popcorn”}) \Rightarrow \text{buys}(X, \text{“coke”})$
- ❑ Attributes can be categorical or numerical
 - ❑ Categorical Attributes (e.g., *profession*, *product*: no ordering among values): Data cube for inter-dimension association
 - ❑ Quantitative Attributes: Numeric, implicit ordering among values—discretization, clustering, and gradient approaches