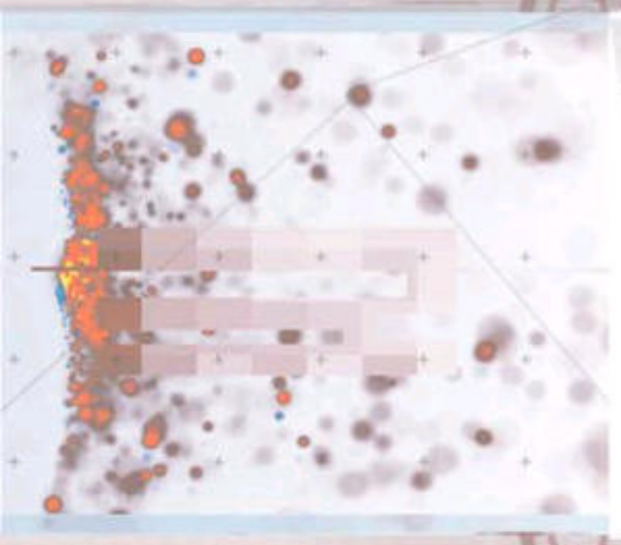

Mining Multi-Dimensional Associations

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- Single-dimensional rules (e.g., items are all in "product" dimension)
  - buys(X, "milk") ⇒ buys(X, "bread")
- Multi-dimensional rules (i.e., items in ≥ 2 dimensions or predicates)
  - Inter-dimension association rules (*no repeated predicates*)
    - age(X, "18-25") ∧ occupation(X, "student") ⇒ buys(X, "coke")
  - Hybrid-dimension association rules (*repeated predicates*)
    - age(X, "18-25") ∧ buys(X, "popcorn") ⇒ buys(X, "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