

The background features a complex, abstract design. It includes a network of thin, reddish-brown lines forming a web-like structure. Scattered throughout are small, colored dots in shades of green, blue, and orange. A prominent white, angular shape, resembling a stylized 'V' or a folded piece of paper, is positioned in the upper center, partially obscuring the text. To the left of this shape is a small, rectangular inset showing a grid of orange and brown squares. The overall color palette is muted, with earthy tones and a touch of vibrant color from the dots.

Mining Spatial Associations

Spatial Frequent Patterns and Associations

- Spatial frequent patterns and association rule: $A \Rightarrow B [s\%, c\%]$
 - A and B are sets of spatial or non-spatial predicates, e.g.,
 - Topological relations: *intersects, overlaps, disjoint*, etc. 拓扑关系
 - Spatial orientations: *left_of, west_of, under*, etc. 空间位置
 - Distance information: *close_to, within_distance*, etc. 距离信息
 - Measures: $s\%$: support, and $c\%$: confidence of the rule
- Example: Rules likely to be found
 - $is_a(x, large_town) \wedge intersect(x, highway) \rightarrow adjacent_to(x, water) [7\%, 85\%]$
- Explore spatial autocorrelation: Spatial data tends to be highly self-correlated (*nearby things are more related than distant ones*)
 - E.g., neighborhood, temperature

Mining Spatial Associations: Progressive Refinement

- Hierarchy of spatial relationship:
 - *close_to* is a generation of *near_by*, *touch*, *intersect*, *contain*, ...
 - **Progressive refinement**: First search for rough relationship and then refine it
- Two-step mining of spatial association:
 - Step 1: Rough spatial computation (as a filter)
 - Using MBR (Minimum Bounding Rectangle) or R-tree for rough estimation
 - Step 2: Detailed spatial algorithm (as refinement)
 - Apply only to those objects which have passed the rough spatial association test (no less than *min_support*)

Rough + Detailed

save mining cost

Apriori 思想

