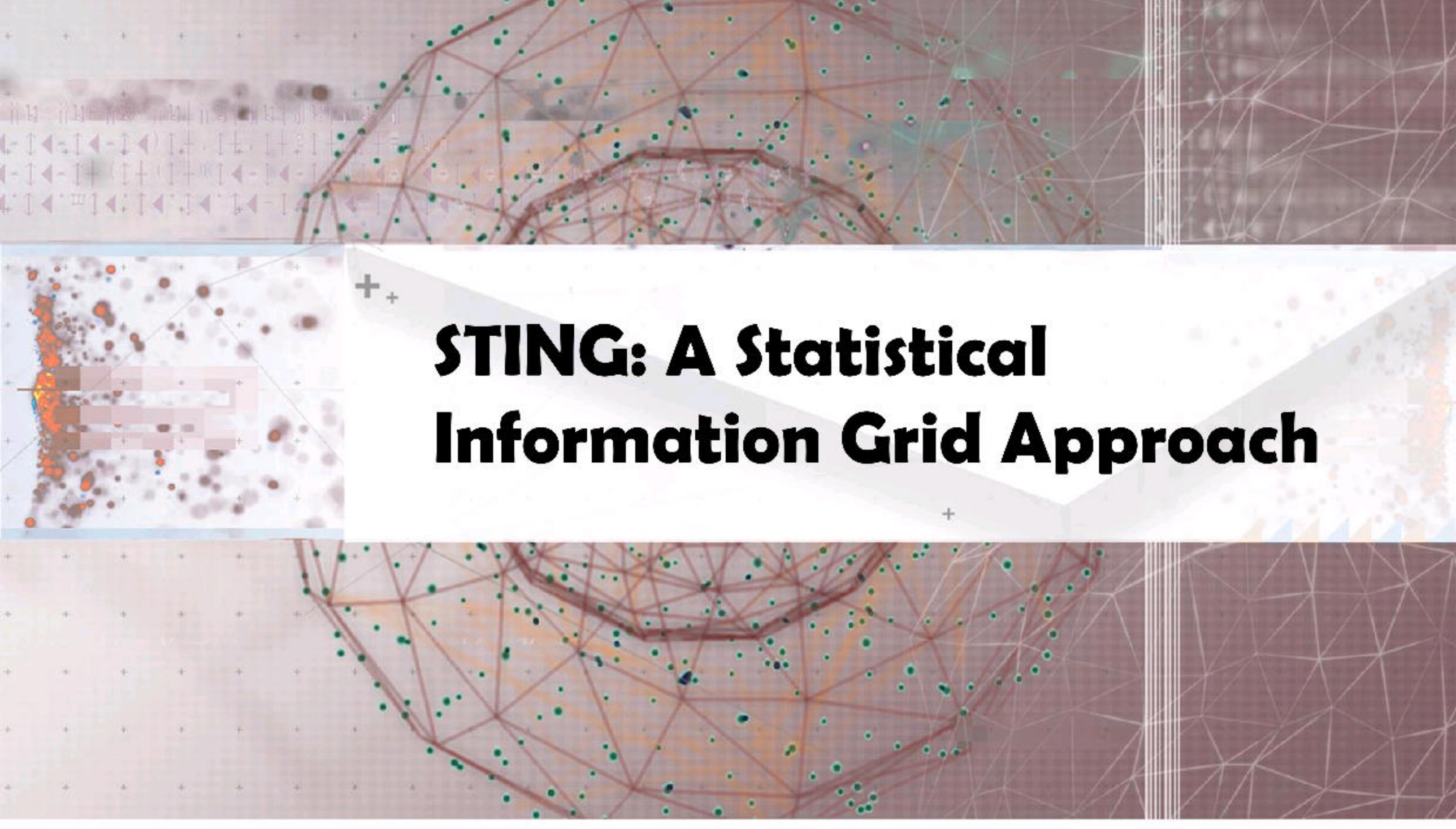
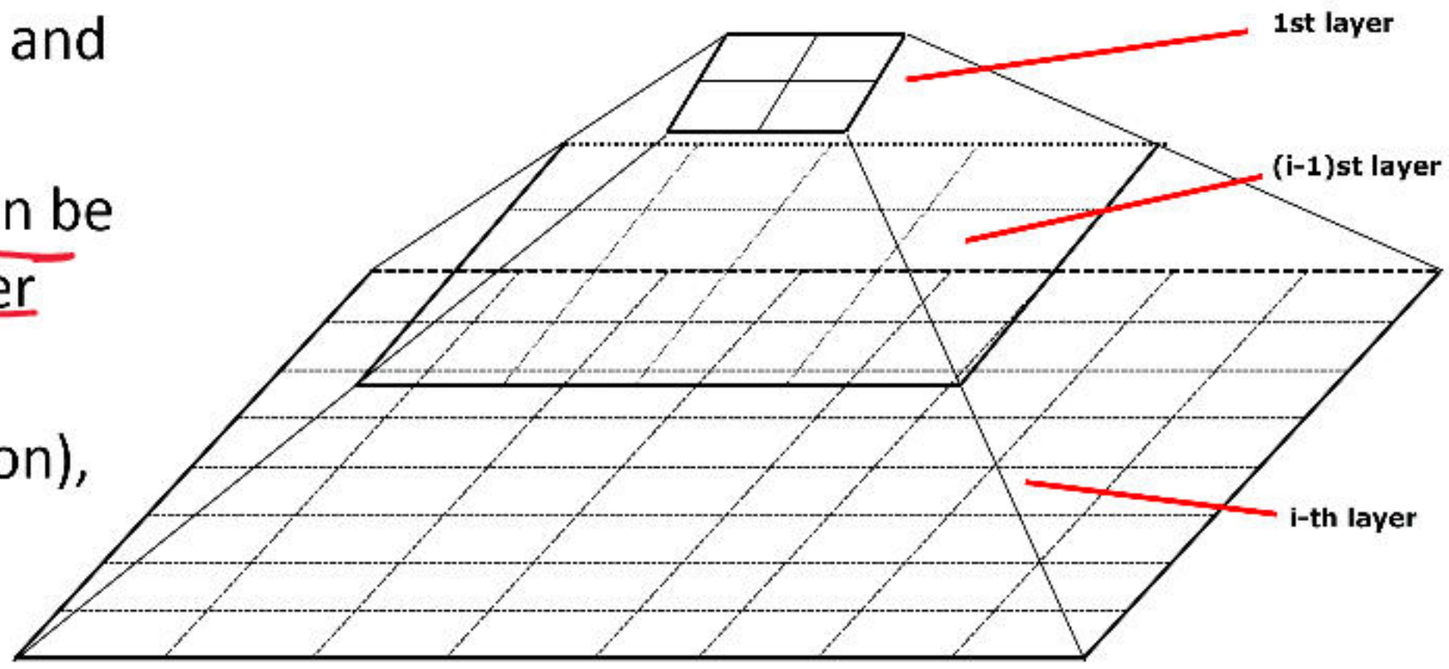


STING: A Statistical Information Grid Approach

STING: A Statistical Information Grid Approach

- STING (Statistical Information Grid) (Wang, Yang and Muntz, VLDB'97)
- The spatial area is divided into rectangular cells at different levels of resolution, and these cells form a tree structure
- A cell at a high level contains a number of smaller cells of the next lower level
- Statistical information of each cell is calculated and stored beforehand and is used to answer queries
- Parameters of higher level cells can be easily calculated from that of lower level cell, including
  - *count*, *mean*, *s*(standard deviation), *min*, *max*
  - type of distribution—*normal*, *uniform*, etc.



Query Processing in STING and Its Analysis

- To process a region query
  - Start at the root and proceed to the next lower level, using the STING index
  - Calculate the likelihood that a cell is relevant to the query at some confidence level using the statistical information of the cell
  - Only children of likely relevant cells are recursively explored
  - Repeat this process until the bottom layer is reached
- Advantages
  - Query-independent, easy to parallelize, incremental update
  - Efficiency: Complexity is O(K)
    - K: # of grid cells at the lowest level, and K << N (i.e., # of data points)
- Disadvantages
  - Its probabilistic nature may imply a loss of accuracy in query processing