

The background of the slide is a complex, abstract composition. It features a dark, reddish-brown base with a network of thin, light-colored lines forming a web-like structure. Scattered throughout are numerous small, colored dots in shades of green, blue, and orange. In the upper left, there's a lighter, more textured area with a grid of small, light-colored dots. A large, white, angular shape, resembling a stylized 'V' or a folded piece of paper, is positioned in the center, serving as a backdrop for the title. The title itself is in a bold, black, sans-serif font.

# **Extensions to Hierarchical Clustering**



# Extensions to Hierarchical Clustering

## Major weaknesses of hierarchical clustering methods

Can never undo what was done previously

一旦分成两部分, 便不会再 merge 了.

Do not scale well

Time complexity of at least  $O(n^2)$ , where  $n$  is the number of total objects

## Other hierarchical clustering algorithms

clustering feature tree

BIRCH (1996): Use CF-tree and incrementally adjust the quality of sub-clusters

CURE (1998): Represent a cluster using a set of well-scattered representative points

CHAMELEON (1999): Use graph partitioning methods on the K-nearest neighbor graph of the data