Hypergraph Based Visual Categorization and Segmentation

Yuchi Huang  Qingshan Liu  Dimitris Metaxas
Computer Science Department, Rutgers University

An Example of Hypergraph

1) By hypergraph, one may consider the relationship above three or more data points to determine if they belong to the same cluster. This representation may be useful in a lot of practical problems.
2) By hypergraph, it is not necessary to integrate affinities computed from different cues into a single similarity function.

Projects
1) Image / Video object segmentation
2) Image categorization/retrieval

Technical demonstrations and publications will be delivered.

Why Hypergraph

(1) Video Object Segmentation

Applications:
Object tracking, video surveillance, general object detection/recognition

(2) Image Categorization/Retrieval

Applications:
Web image search and categorization, medical image classification

Milestones (1)

• In three months: collection of more video data and development of semi-supervised algorithms
• In six months: testing of algorithms, incorporating more prior information to enhance the accuracy
• In one year: delivery of a video object segmentation demo

Milestones (2)

• In three months: collection of image data and development of semi-supervised/supervised algorithms
• In six months: testing of algorithms, testing of random sampling for large scale data sets
• In one year: delivery of a (large scale) image search demo