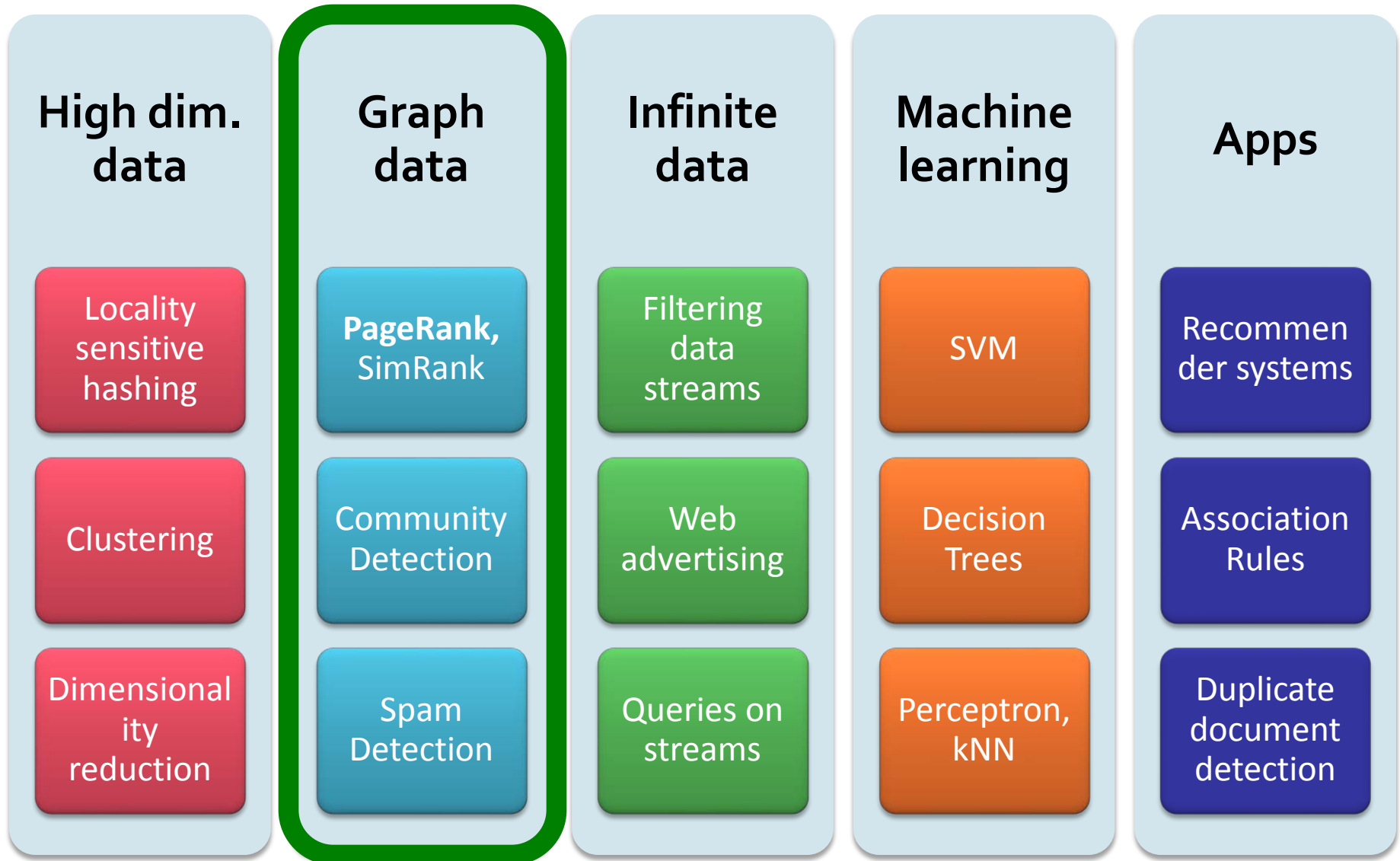


# Analysis of Large Graphs: Detecting clusters

Mining of Massive Datasets  
Leskovec, Rajaraman, and Ullman  
Stanford University

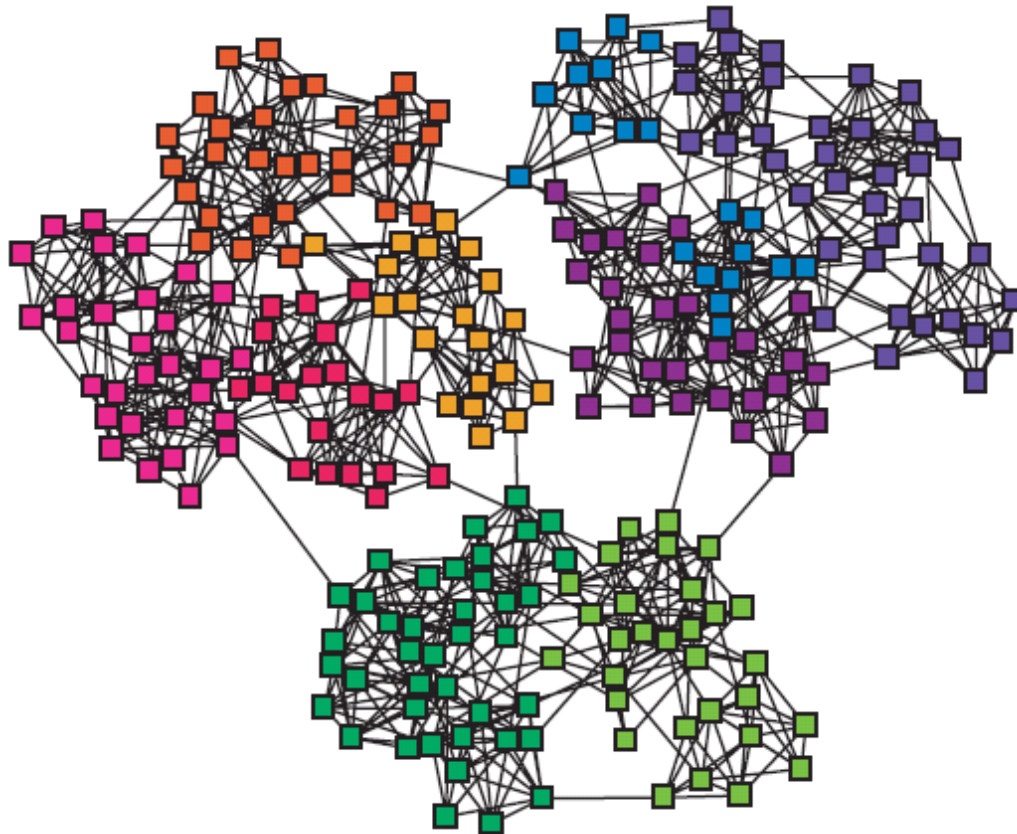


# New Topic: Graph Data!

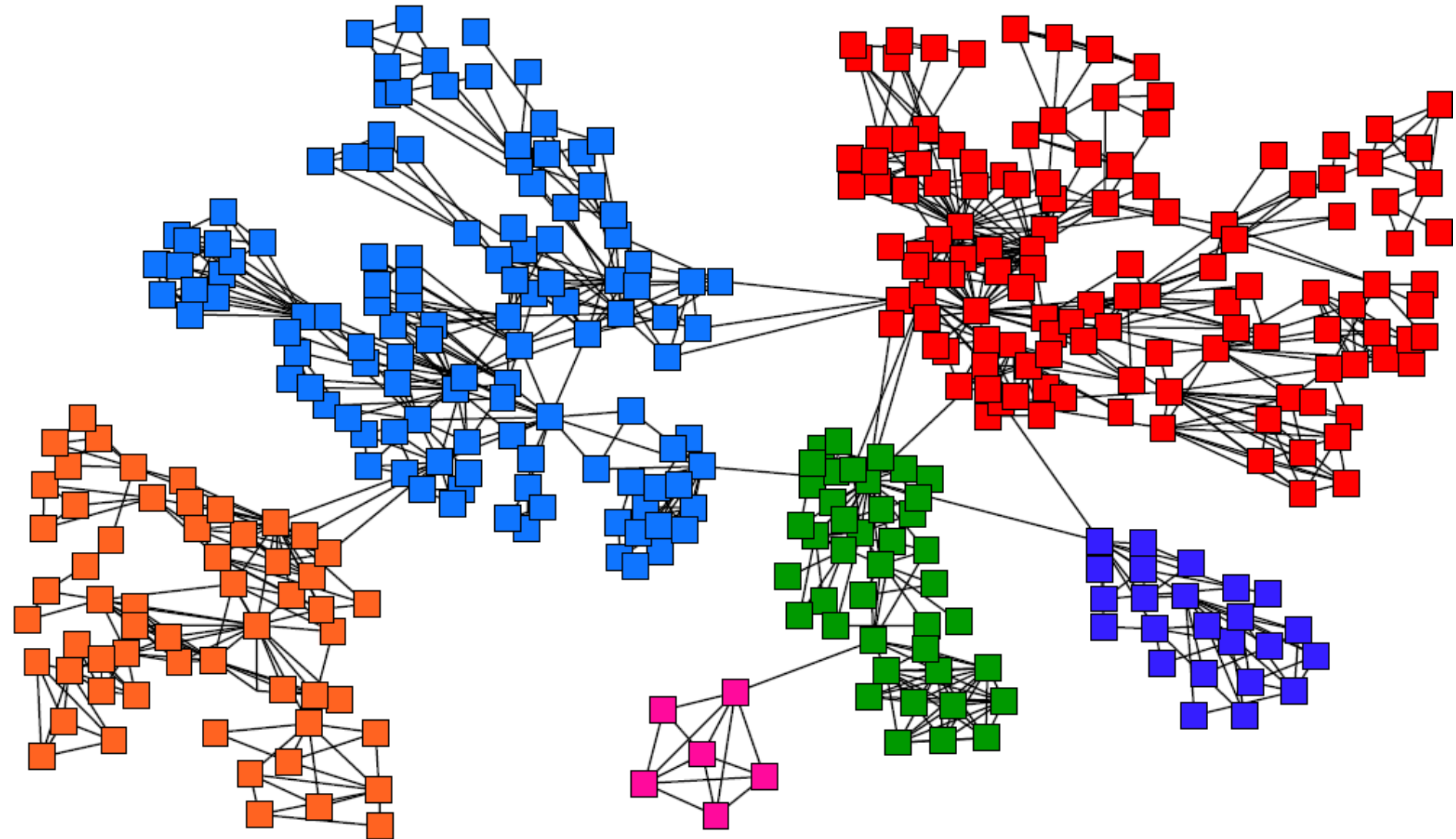


# Networks & Communities

- We often think of networks being organized into **modules, cluster, communities**:

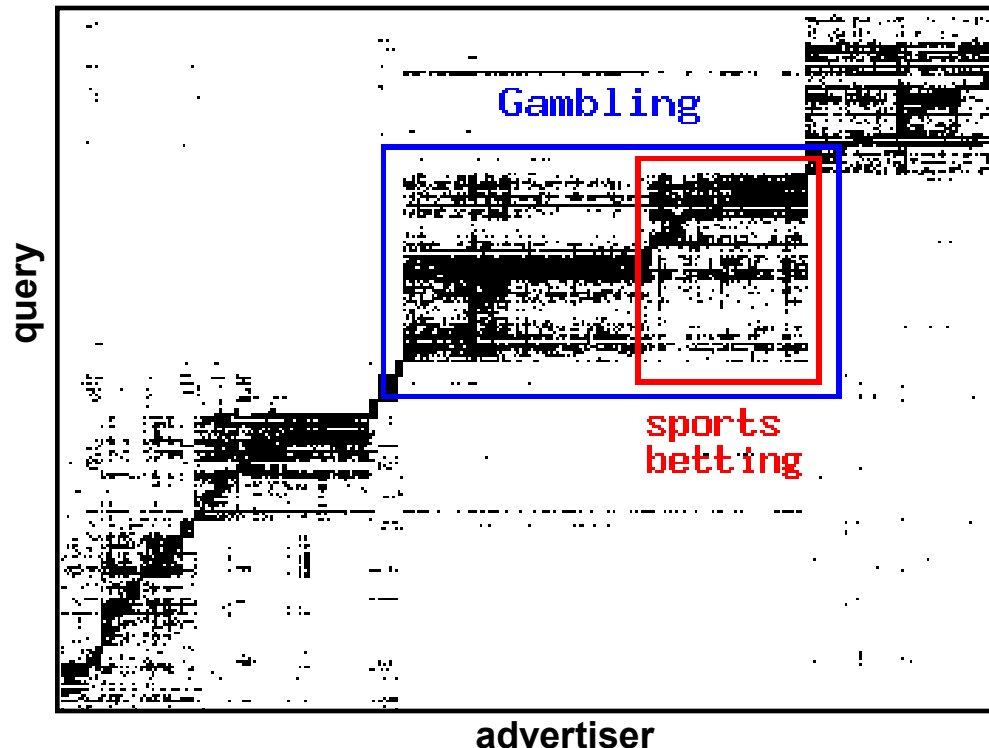


# Goal: Find Densely Linked Clusters



# Micro-Markets in Sponsored Search

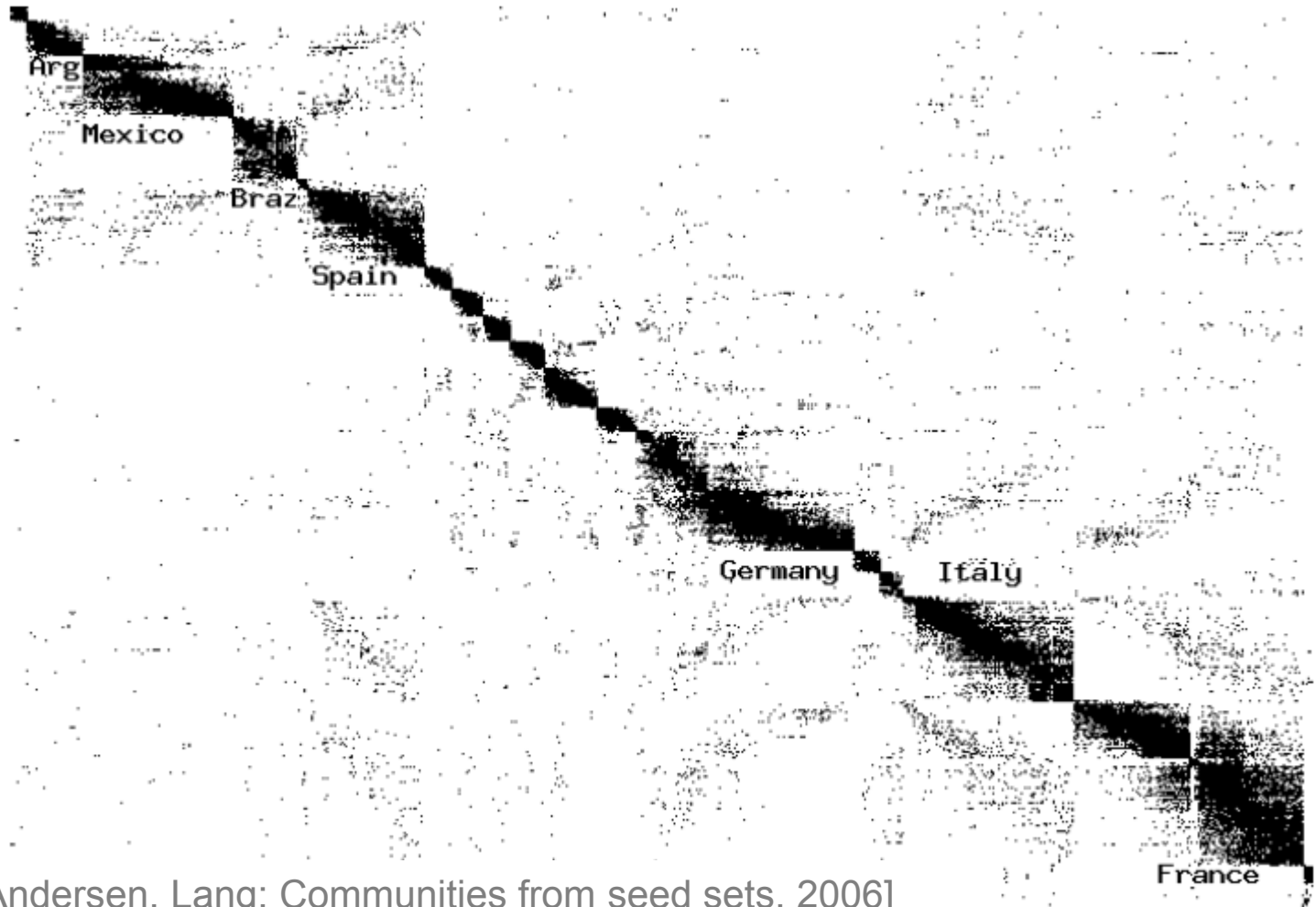
- Find micro-markets by partitioning the query-to-advertiser graph:



[Andersen, Lang: Communities from seed sets, 2006]

# Movies and Actors

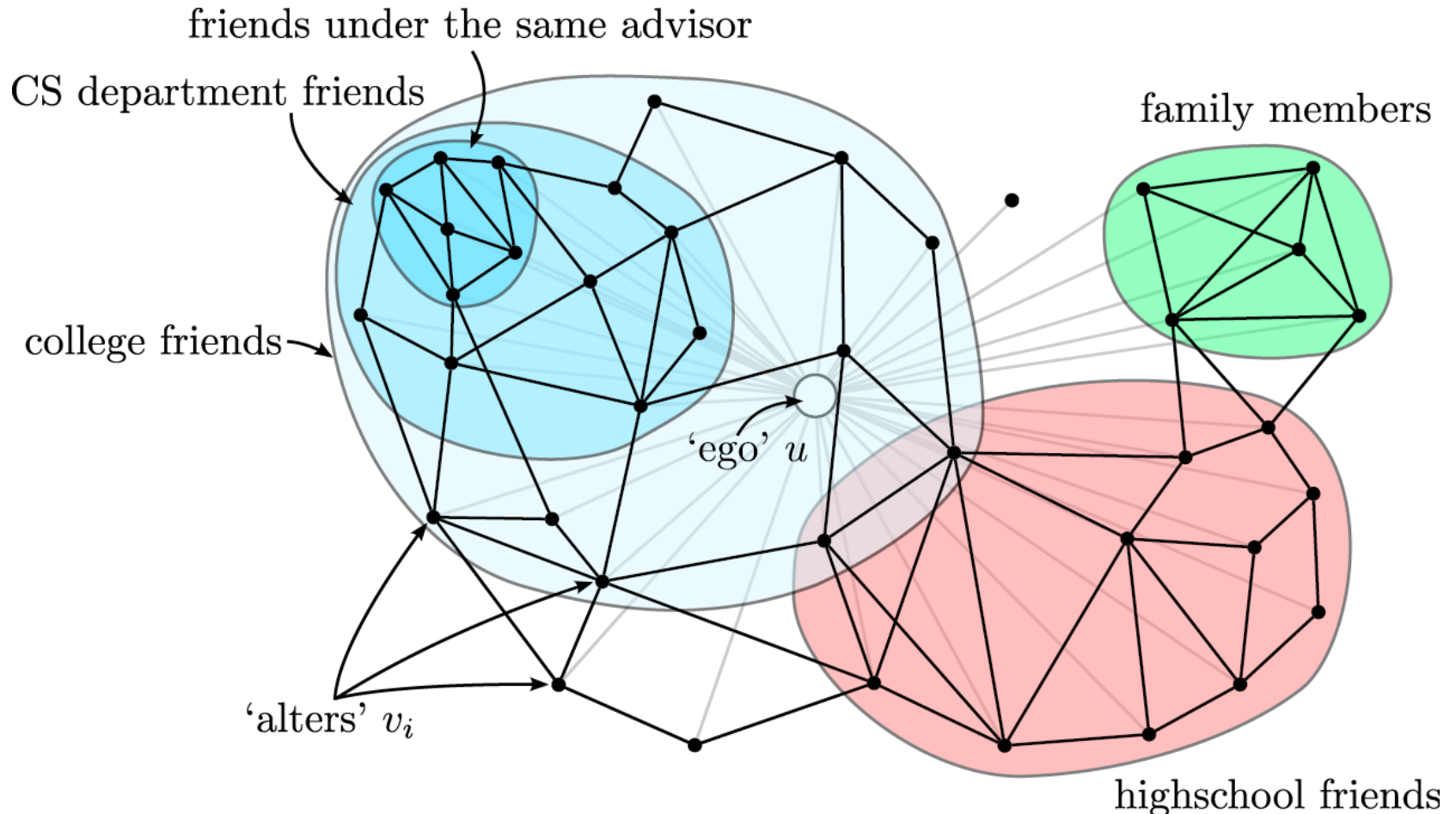
- **Clusters in Movies-to-Actors graph:**



[Andersen, Lang: Communities from seed sets, 2006]

# Twitter & Facebook

## ■ Discovering social circles, circles of trust:



[McAuley, Leskovec: Discovering social circles in ego networks, 2012]