

SNA 4: community structure

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Outline

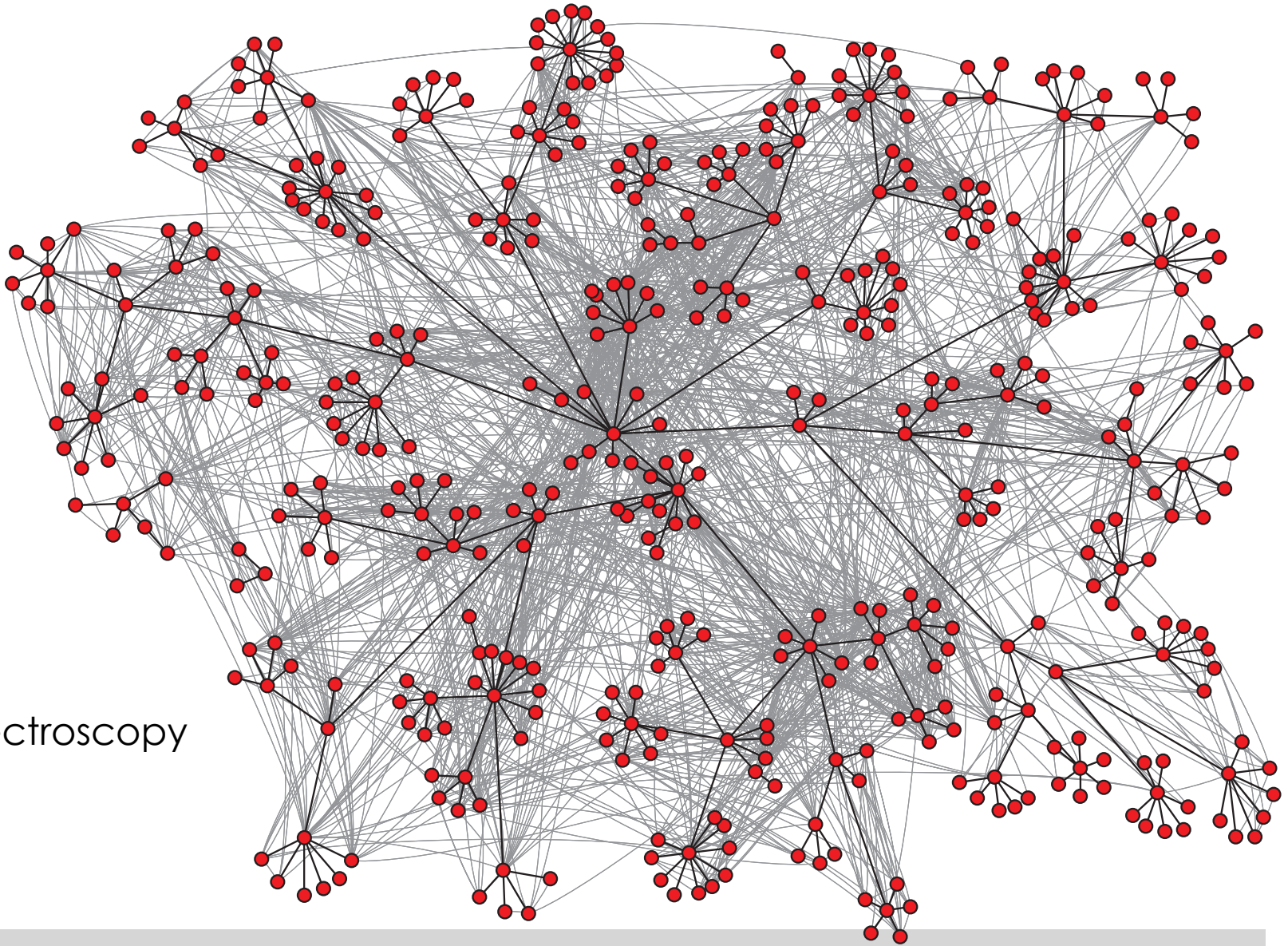
- ▣ why do we look for community structure?
 - ▣ we need to define it in order to find it
 - ▣ approaches to finding it
-

Why do it?

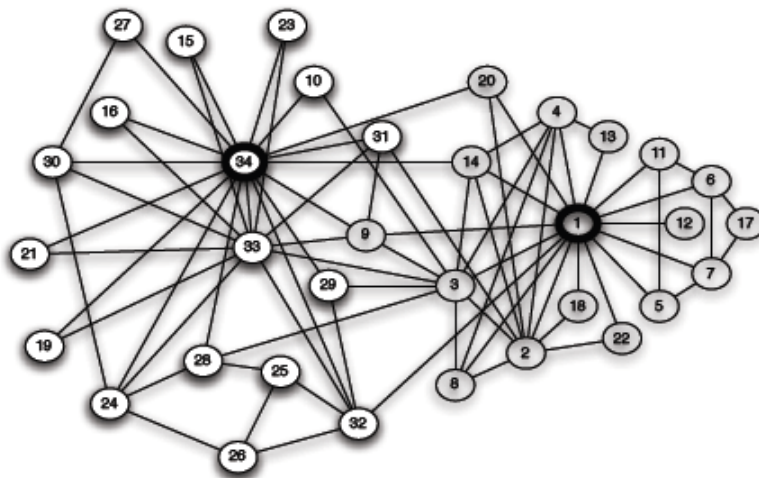
- ▣ Discover communities of practice
 - ▣ Measure isolation of groups
 - ▣ Understand opinion dynamics / adoption
-

Why look for community structure?

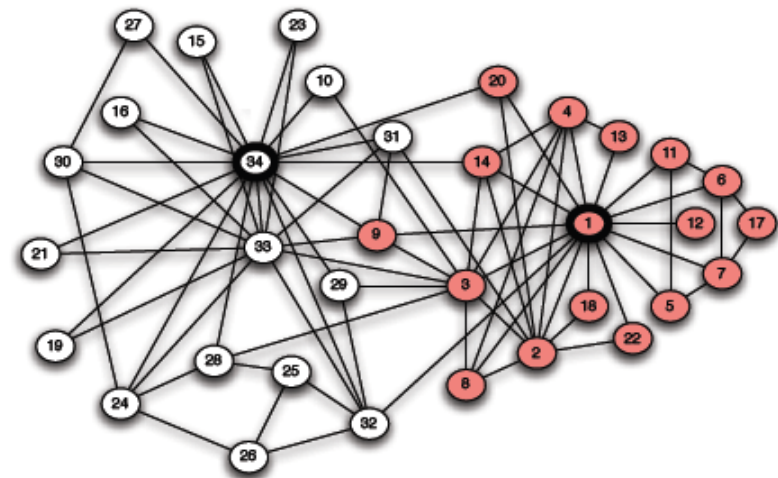
example:
email spectroscopy



Zachary Karate Club



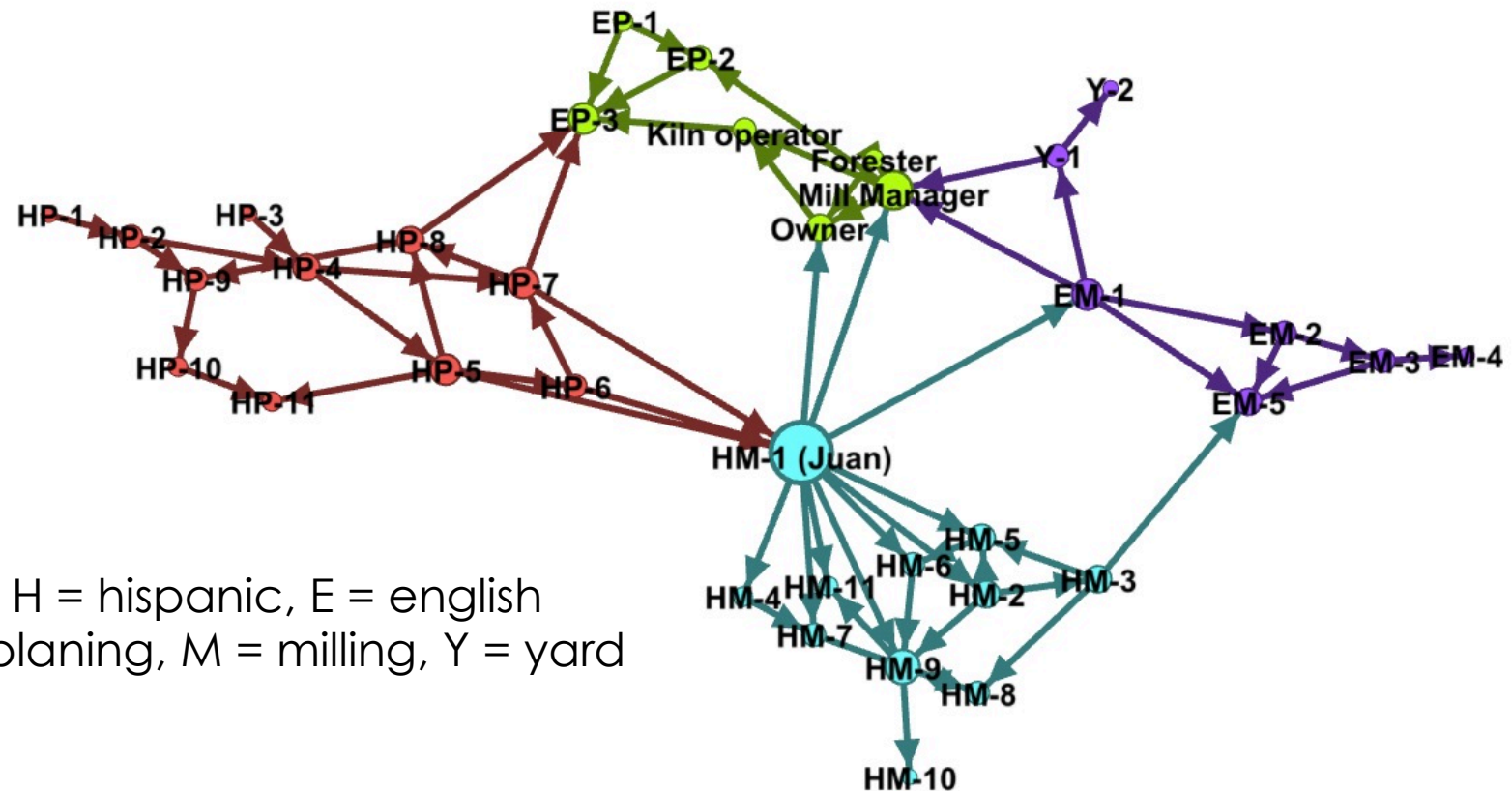
(a) *Karate club network*



(b) *After a split into two clubs*

source:Easley/Kleinberg

Why look for community structure?



Key, H = hispanic, E = english
P = planing, M = milling, Y = yard

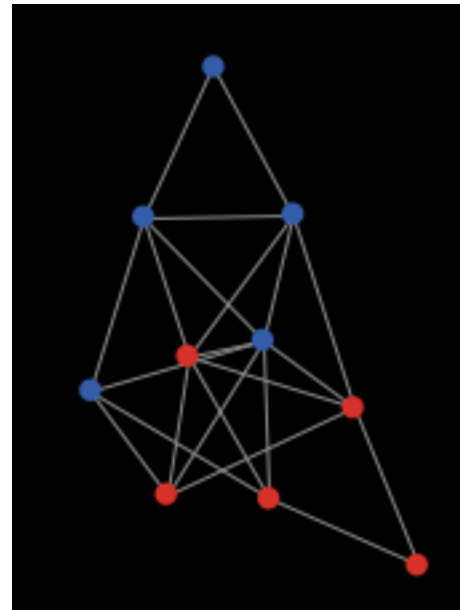
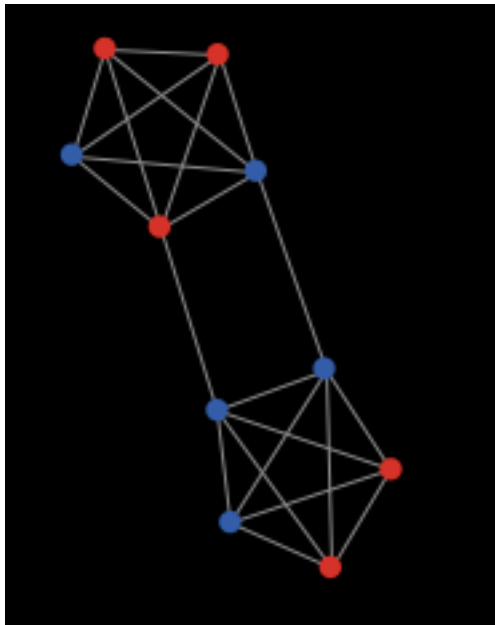
Sawmill network: source Exploratory Social Network Analysis with Pajek

Quiz Q:

- The management at the sawmill was having difficulty persuading the workers to adopt a new plan, even though everyone would benefit. In particular the Hispanic workers (H) were reluctant to agree. The management called in a sociologist who mapped out who talked to whom regularly. Then they suggested that the management talk to Juan and have him talk to the Hispanic workers. It was a success, promptly everyone was on board with the new plan. Why?

opinion formation and community structure

- ▣ <http://www.ladamic.com/netlearn/NetLogo502/OpinionFormationModelToy.html>
- ▣ each node adopts the majority opinion of its neighbors (flips a coin if it's a tie)

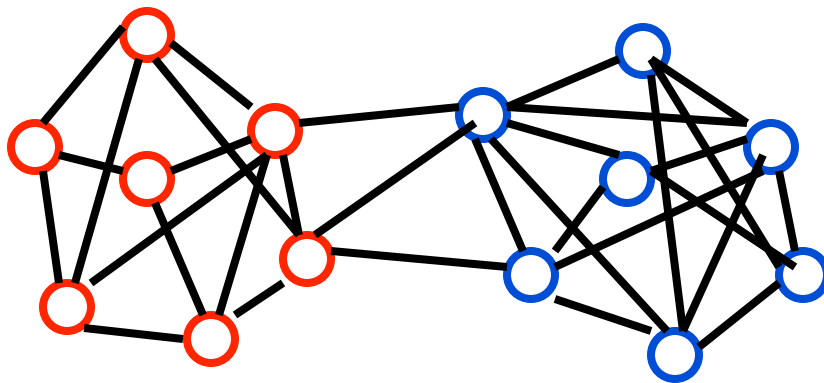


Quiz Q:

- Alternate between the 2 community and the Erdos-Renyi configuration. Which can maintain divergent opinions when you iterate opinion updates:
 - just Erdos-Renyi
 - just 2-community
 - both

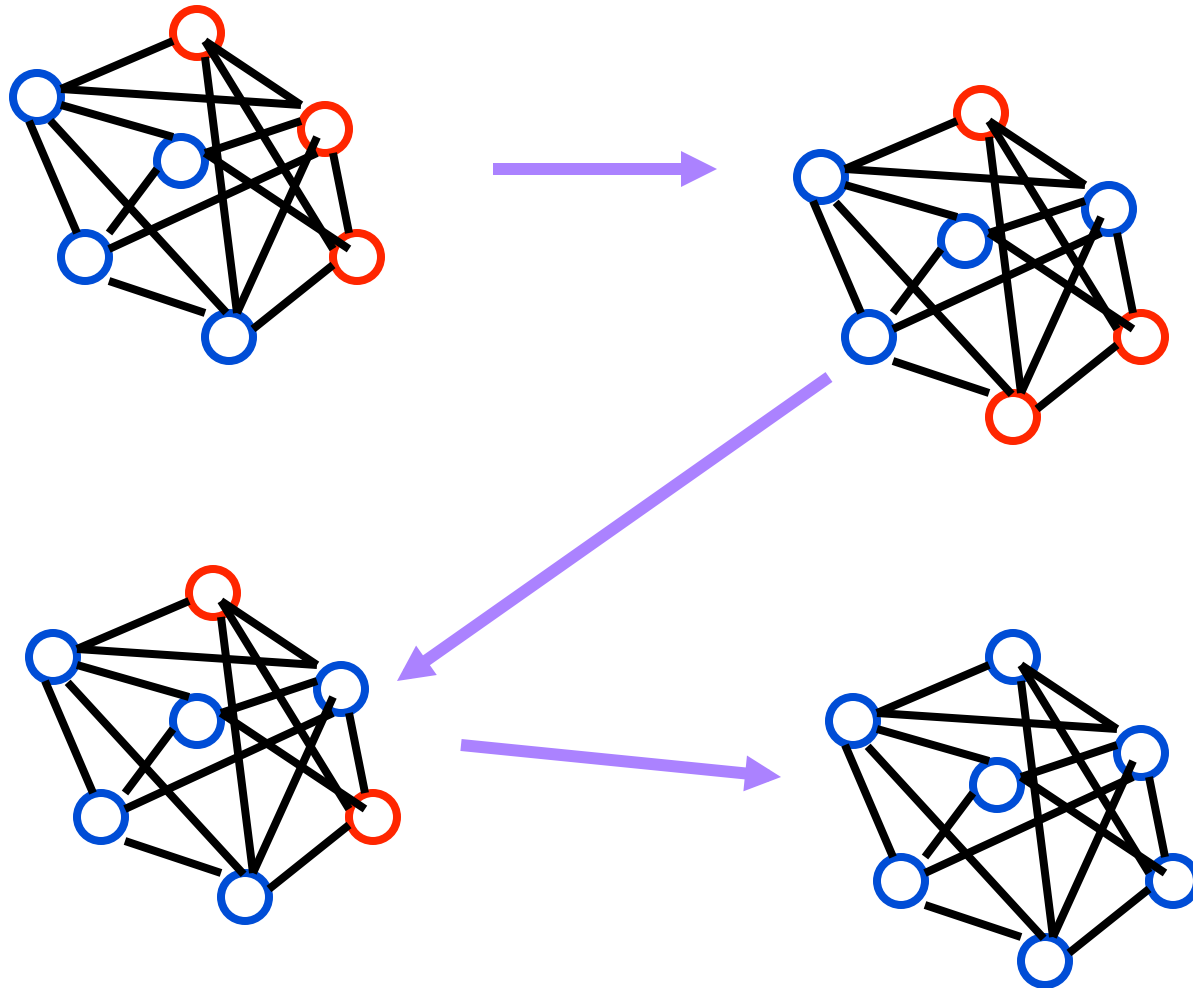
Why care about group cohesion?

- opinion formation and uniformity



- if each node adopts the opinion of the majority of its neighbors, it is possible to have different opinions in different cohesive subgroups

within a cohesive subgroup – greater
uniformity

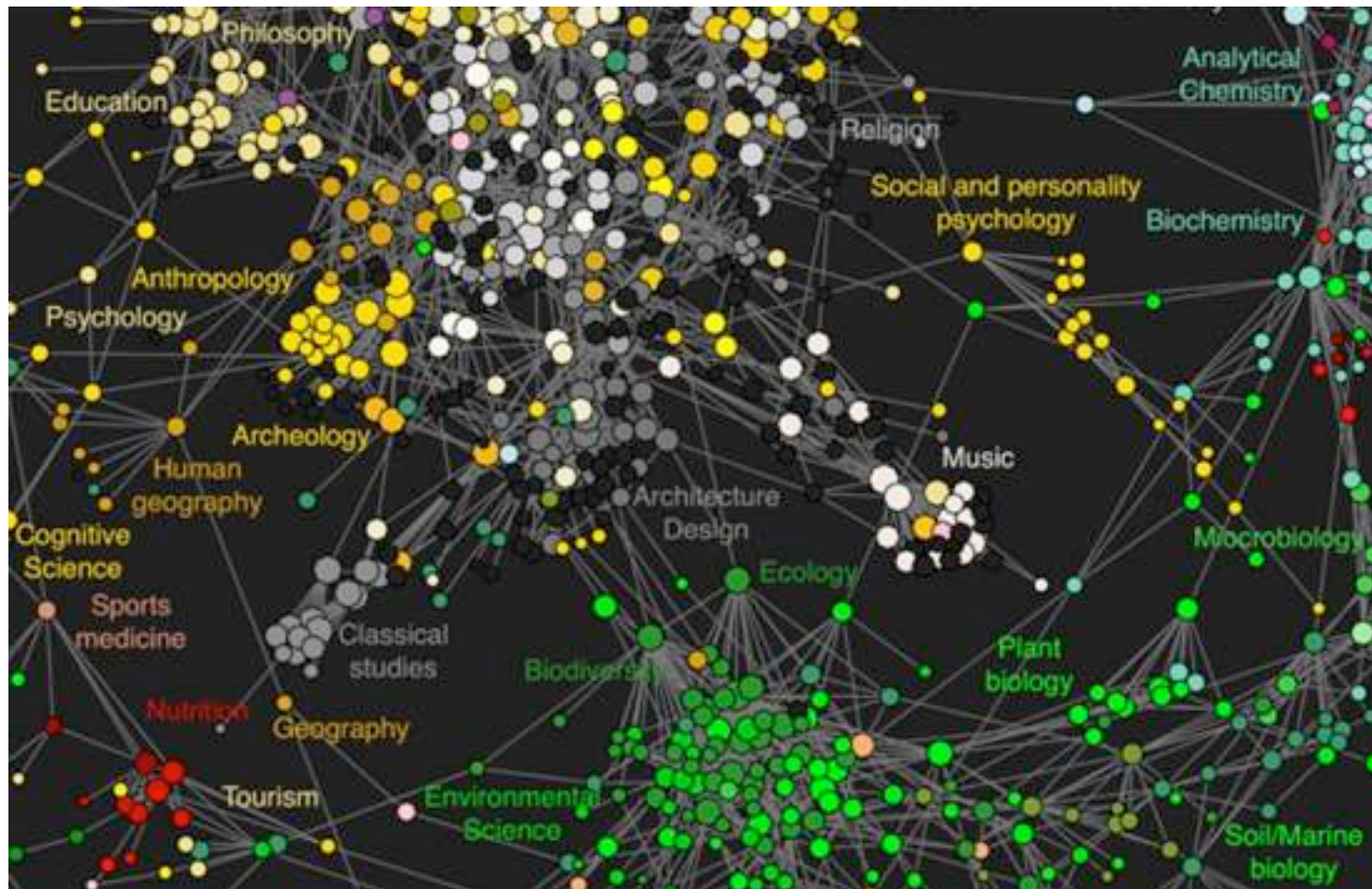


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