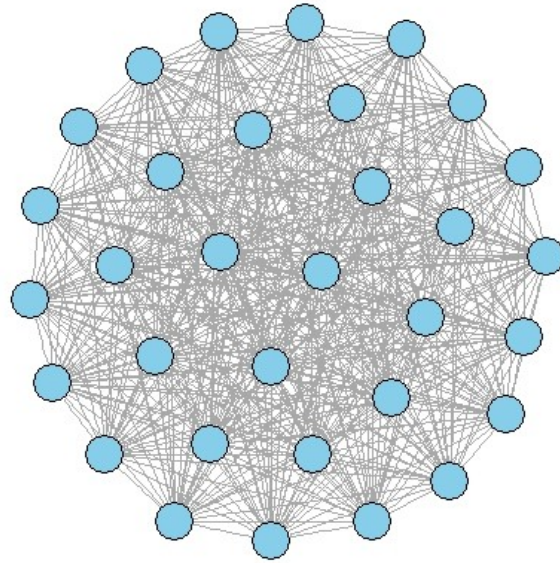


Performance optimization in educational and company networks



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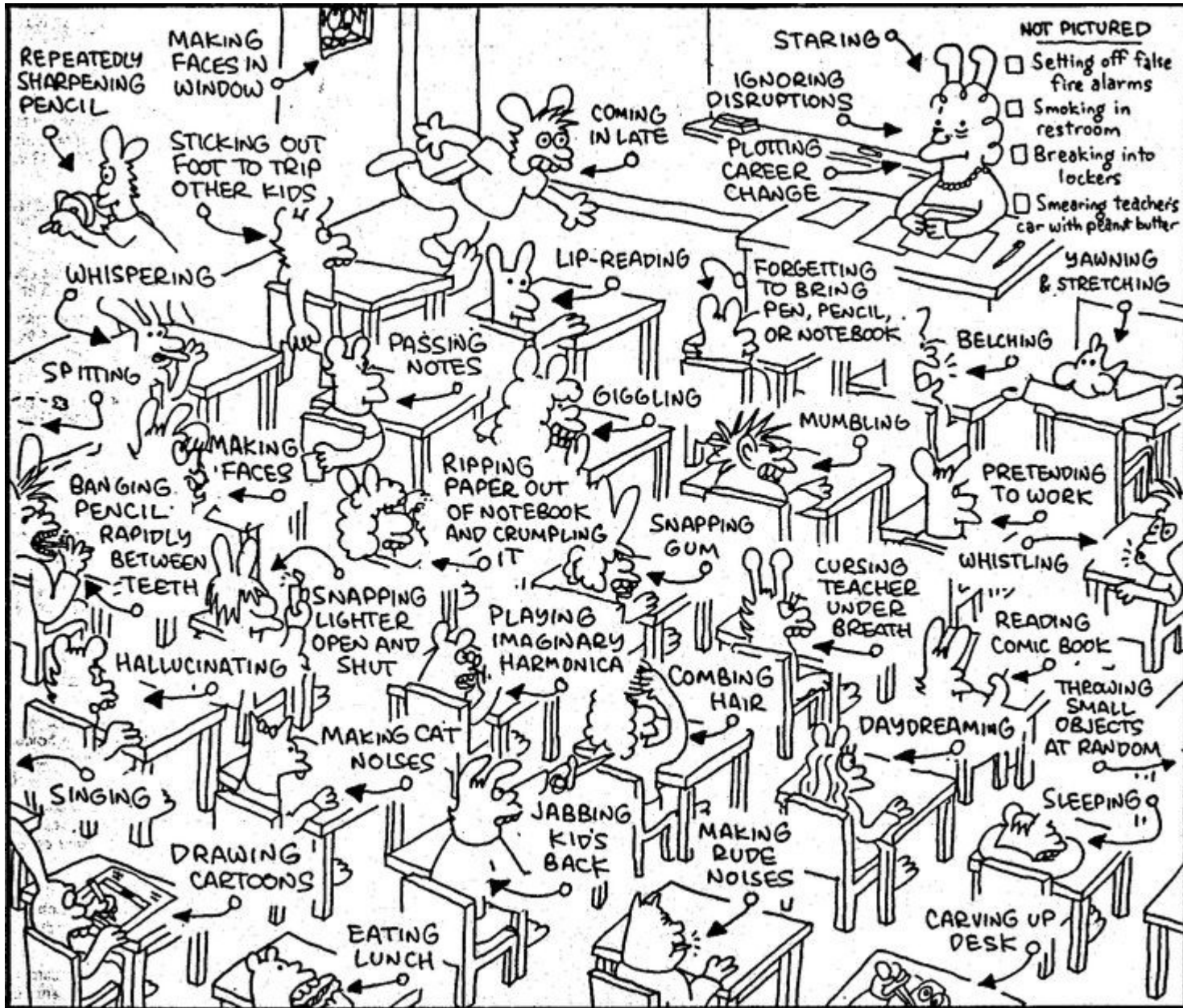
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Goal

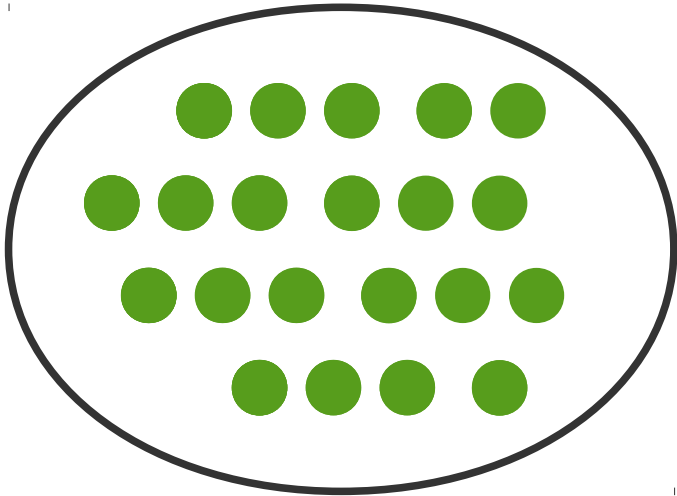


Goal

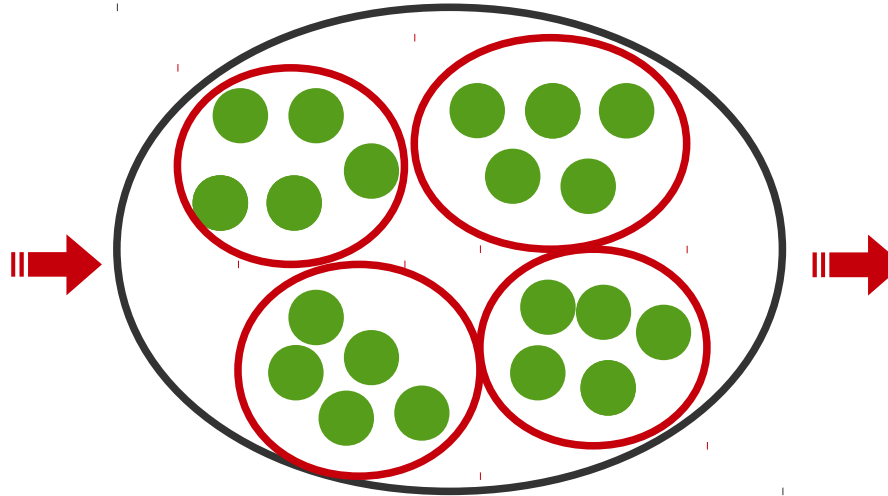
Given individual skills, a task and a social network, how can we create a **partition with optimal performance?**

Model

Class (N)



Partition (n)



Optimize
performance

● S_i : Individual score

● → ● k_{ij} : links between nodes $\{-1,0,1\}$

Model

Assumptions

- Groups with same average score will perform the same if they are fully unknown to each other.
- Positive social connections increase group performance, bad connections are detrimental.

Model

Preeeeeeeeeeeeliminary approach

Group performance $F = \sum f_i s_i$

Individual social affinity $f_i = \frac{n_i^{+1} + w n_i^0}{n-1}, 0 < w < 1$

n_i^{+1} # positive connections

w Relative relevance of neutral connections

n_i^0 # neutral connections

Model

Small groups: calculation of all the possible combinations $\binom{N}{n}$

Algorithm (high N)

- Start with N/n partitions with similar average group marks
- Compute performance F for all groups
- Rewire groups in order to obtain better overall performance

Future research

- Experimental design to estimate performances with and without social structure.
- Exploration of other performance functions related to scores and links.
- Finding appropriate heuristics to solve the problem for arbitrarily large N .

Research impact

This approach may help companies and institutions to improve both **productivity** and **social welfare** through group design

