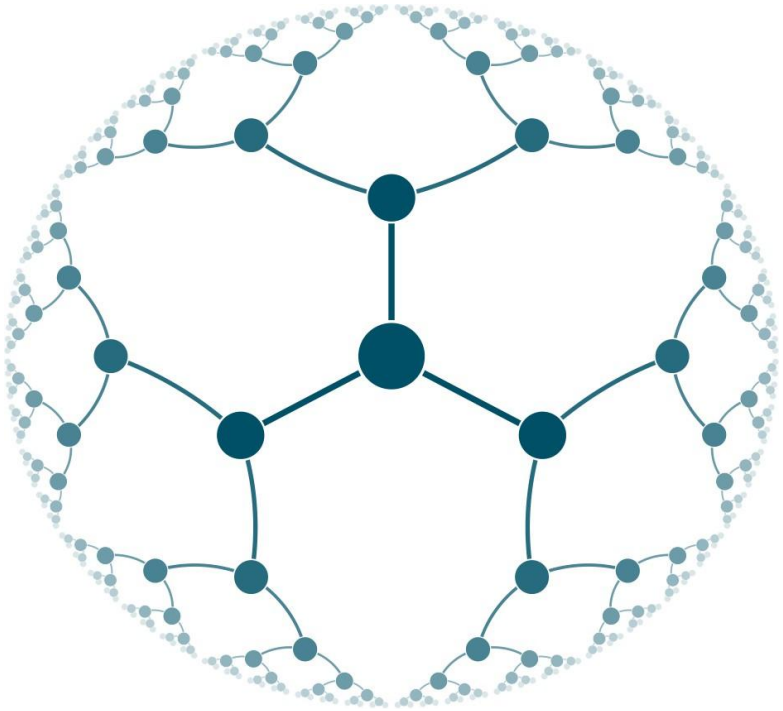
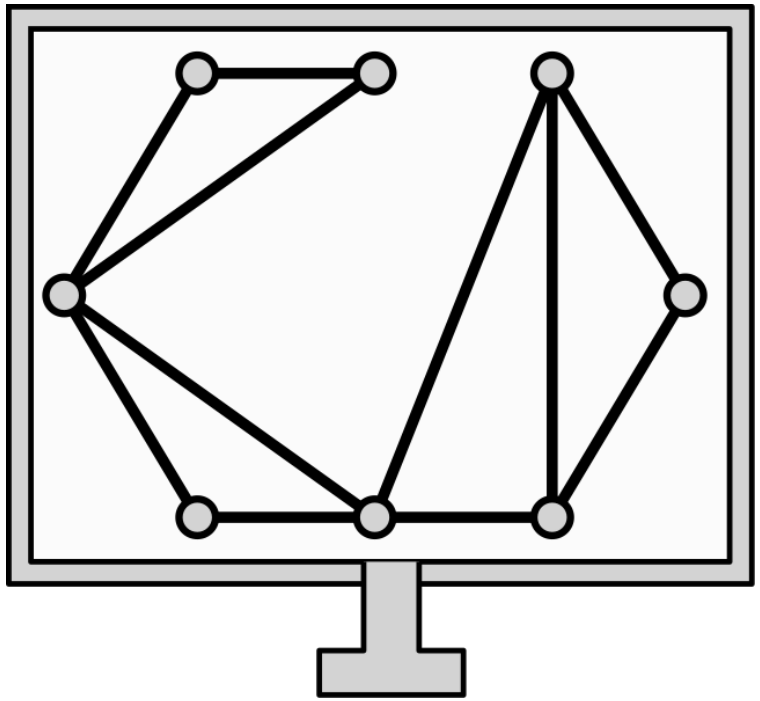
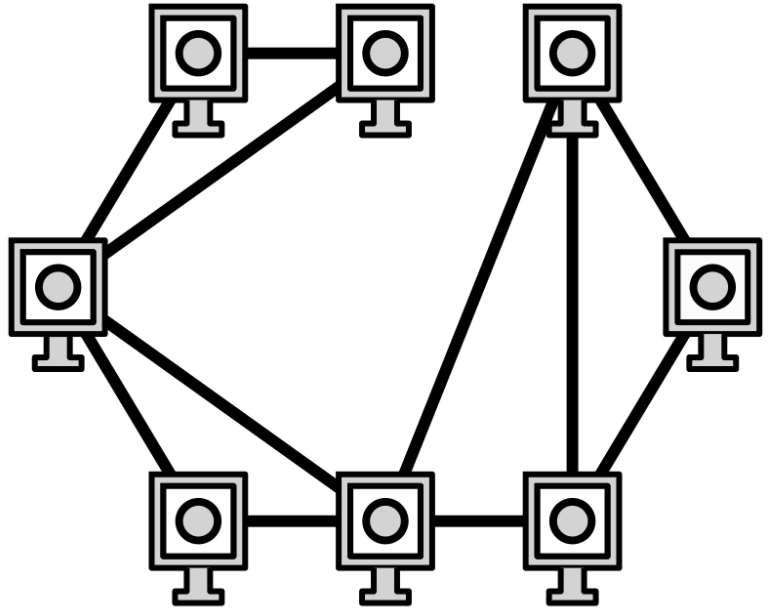


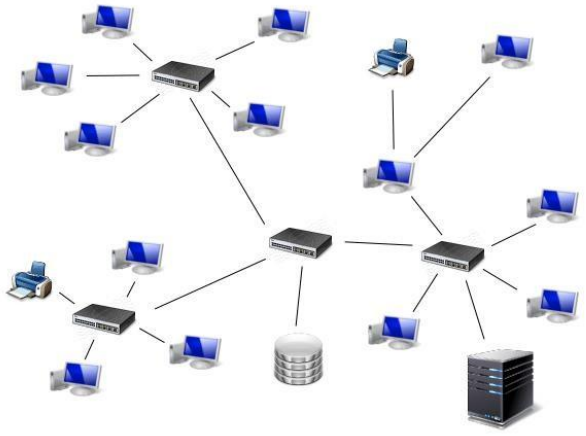
Principles of Distributed Computing

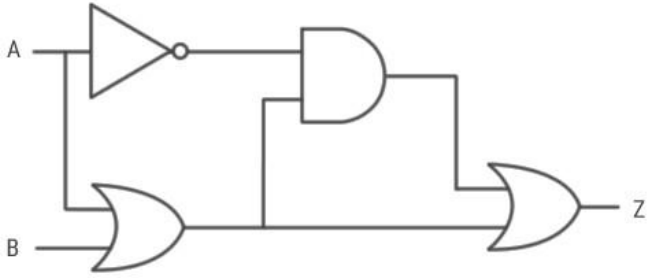


centralized



distributed




A
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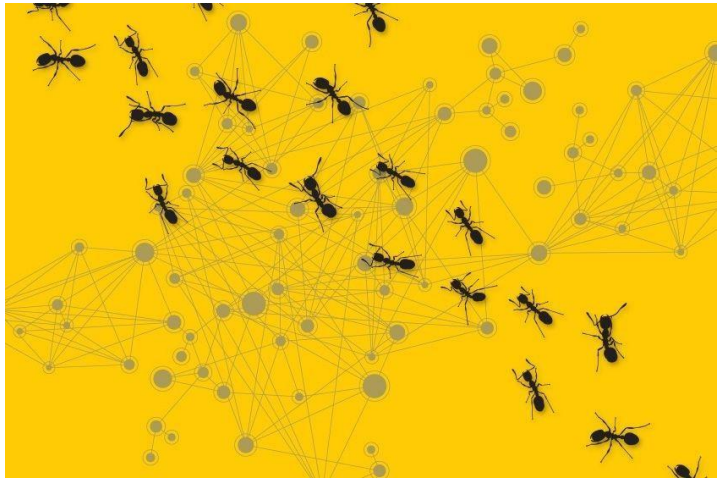


… variety of models
… variety of results

HIGHLIGHTS of Distributed Computing

new "standalone" topic every week!

300 students:

- **200 INFK**
- **50 ITET**
- **CSE, Cyber Security, CBB, Robotics, …**

Prerequisites:

- No formal ones
- Basic knowledge about graphs & probability helps

Lecture (Wednesday 8-10):

- Lecture notes and old recordings available
- We develop the algorithm together!
- Bring your own ideas to the lecture!

Exercises (Wednesday 14-16 & 16-18):

- Exercise sheet online on Wednesday
- Solutions discussed the same day in the exercise sessions

Questions:

- Before, during or after lecture
- Before, during or after exercise session
- On Moodle

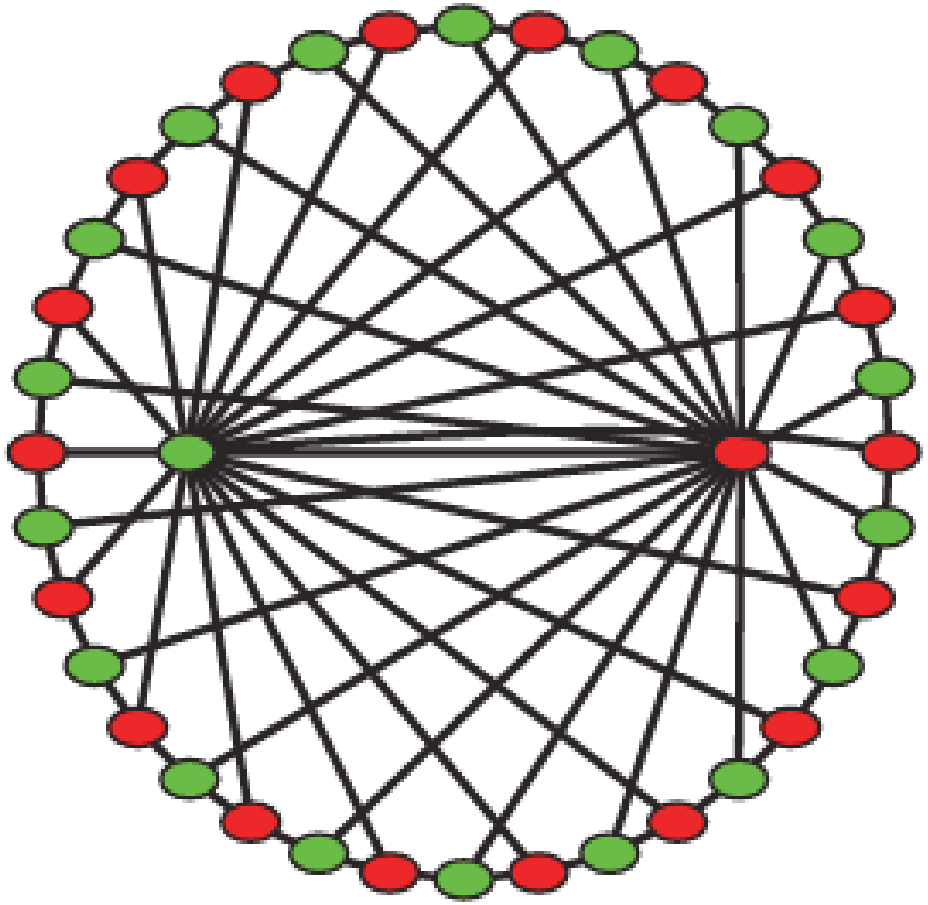
Exam:

- Written
- 2 hours
- Bring any written documents you want

Bonus (0.25):

- Design your own problem with solution
- More information on course website

today: VERTEX COLORING



An Experimental Study of the Coloring Problem on Human Subject Networks

Michael Kearns,* Siddharth Suri, Nick Montfort

Theoretical work suggests that structural properties of naturally occurring networks are important in shaping behavior and dynamics. However, the relationships between structure and behavior are difficult to establish through empirical studies, because the networks in such studies are typically fixed. We studied networks of human subjects attempting to solve the graph or network coloring problem, which models settings in which it is desirable to distinguish one's behavior from that of one's network neighbors. Networks generated by preferential attachment made solving the coloring problem more difficult than did networks based on cyclical structures, and "small worlds" networks were easier still. We also showed that providing more information can have opposite effects on performance, depending on network structure.

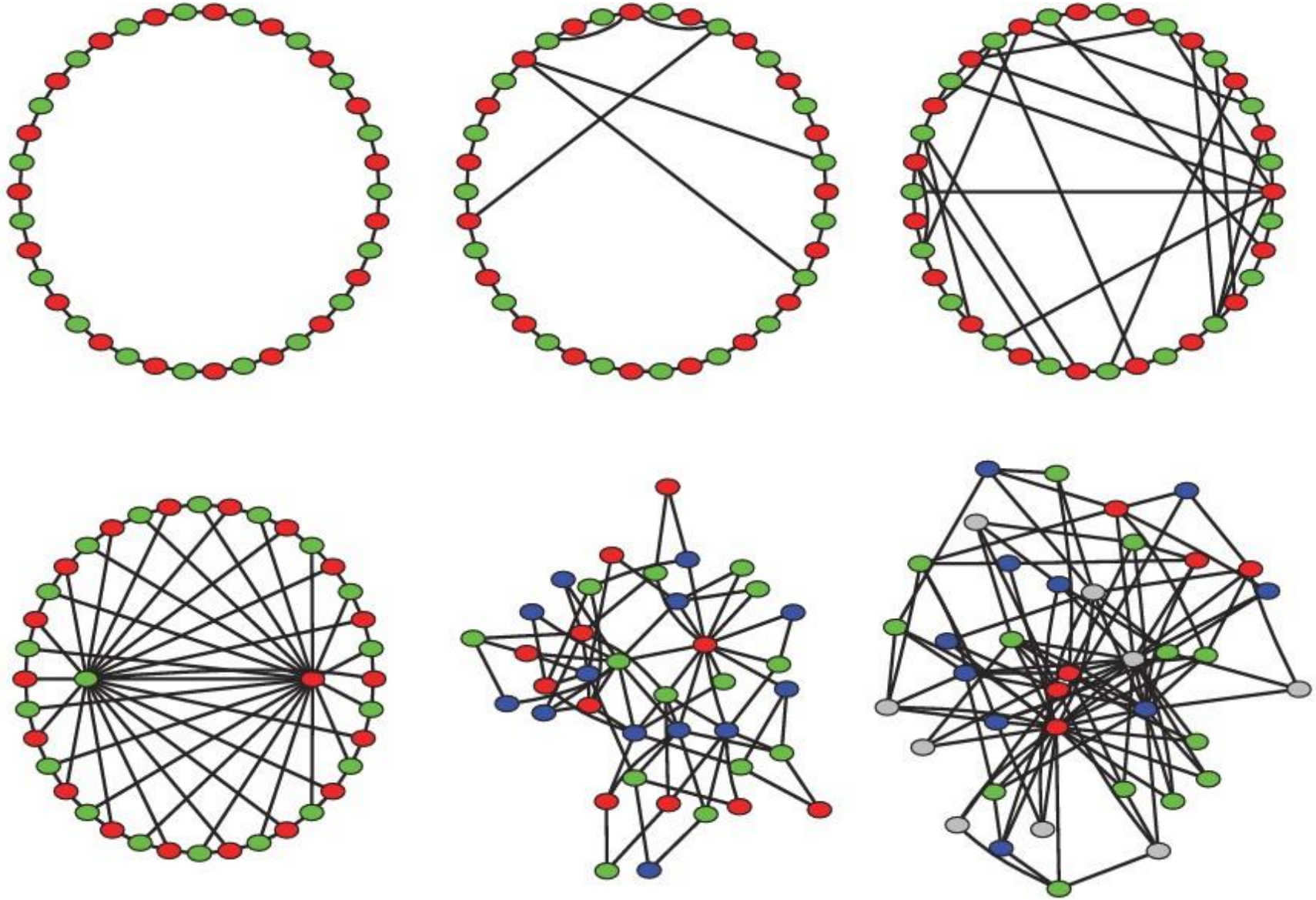


Fig. 1. Network topologies with sample colorings found by subjects. From left to right and top to bottom: simple cycle, 5-chord cycle, 20-chord cycle, leader cycle, and preferential attachment with two and three links initially added to each new vertex.