# Report on Complex Network Systems

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#### Problem

Construct a Barabási-Albert network, where a new vertex is appended to the network with edges to existing m>1 vertices. And evaluate its degree distribution.

### **Guideline for reports**

- 1. Written in neat Japanese or English.
- 2. Use one-side A4 papers in typesetting formats using word-processes or LaTeX.
- 3. Describe the Barabási-Albert network and methods to evaluate its degree distribution.
- 4. Show programs to construct the network and evaluate the quantities.
- 5. Your programs must be well-organized and well-commented.
- 6. Your report should contain the description of your programs. Especially it should contains the organization and the flow of your programs. If you work in object-oriented programming schemes, the relation between classes should be presented in your report.
- 7. The deadline is 5 PM, Feb. 5, 2007. Your report should be submitted to the administration office of Computer and Network Center.

## Evaluation of your report

- Level D: Below the level C. Or your report is thought to be a copy of other ones, or of documents found in the Internet or the literature. Or your programs are thought to be copies of other ones, or of those found in the Internet or the literature.
- Level C: Your report just contains the description of the network and programs for constructing the network. Your report fails to express the evaluation of its degree distribution.
- Level B: Addition to the report with level C, your report contains the description of the degree distribution.
- Level A: Beyond the level B. Your report contains the analysis of the results obtained by the simulations.

### References

- A.-L. Barabási and R. Albert, Science **286** (1999) 509.
- R. Albert and A.-L. Barabási, Rev. Mod. Phys. 74 (2002) 47.
- S. N. Dorogovtsev and J. F. F. Mendes, *Evolution of Networks* (Oxford, 2003).