Complex networks gradus ad parnassum

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Complex networks have received much attention from the academic community in the past decade, with impacts in both science and society. Even so, comprehensive guides are usually lengthy and unaccessible to non-specialists. This text presents the subject and vocabulary issues in literature, the paradigmatic models and their typical measures. A discussion about the ubiquity of network structures, and our own existence as networks, should ease the reader to grasp essential and useful concepts. Metrics, software, related work and exercises are in the Appendixes.

I. INTRODUCTION

A. Basic concepts

1. Graph

2. Complex networks

B. Jargon synonyms and ambiguities

Transitivity, clustering, connectivity, hubs, authorities, intermediaries (betweenness and Erdös Sector), periphery related to diameter of the connective sector, center/hubs. Complexity, Complex Systems and Complex Networks. Anthropological field vs influence.

II. PARADIGMATIC MODELS

A. Small-world

Characteristics, Measures, Generative models.

B. Geographic

Characteristics, Measures, Generative models.

C. Scale-Free

Characteristics, Measures, Generative models.

D. Erdös-Rényi

Characteristics, Measures, Generative models.

E. Other recurrent network characteristics

III. YOU-NETWORKS, I-NETWORKS

A. Stability and differentiation in human social networks

B. Harnessing

Procedures, ontologies, data, software, art, anthropological physics, future forecast, next steps and future work.

IV. CONCLUSIONS

ACKNOWLEDGMENTS

Appendix A: Measures

Equation, definition and reference.

Appendix B: Software, data and media

Appendix C: Related works

1. Articles

2. Books

Appendix D: Exercises

Theory, real data analysis, anthropological physics experiments.