Defining and computing entropy for networks

Henrique Ferrolho - s1683857, Team: Alex Hoppen, Charles Desmonty

***Abstract*—**

I. Introduction

Entropy is the lack of *order* or *predictability*, it is a measure of *randomness* or *disorder* in a system - the greater the disorder the higher the entropy.

We are going to define a measure in order to calculate the entropy of a network graph. But before we do that, we need to agree on what makes a network more or less organized. How does the human notion of order apply to graphs, i.e. having two graphs A and B, what properties make graph A more or less organized and structured than graph B?

II. Related work

III. Results

Fig. 1: TODO.

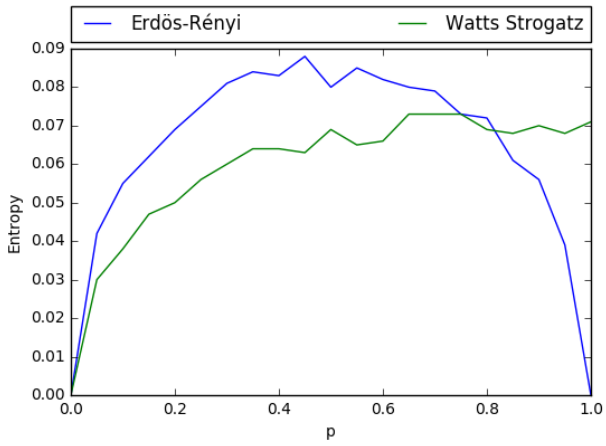

Fig. 2: TODO.

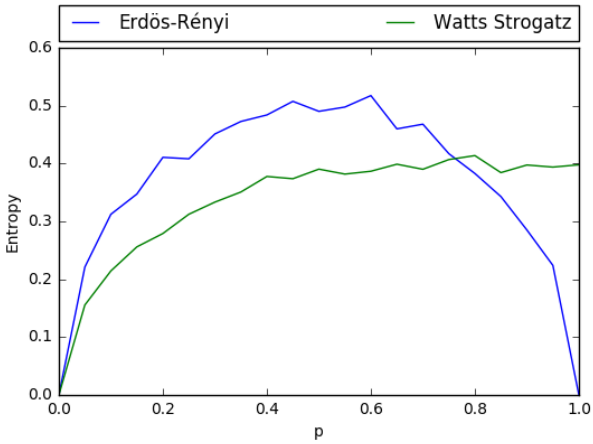

Fig. 3: TODO.

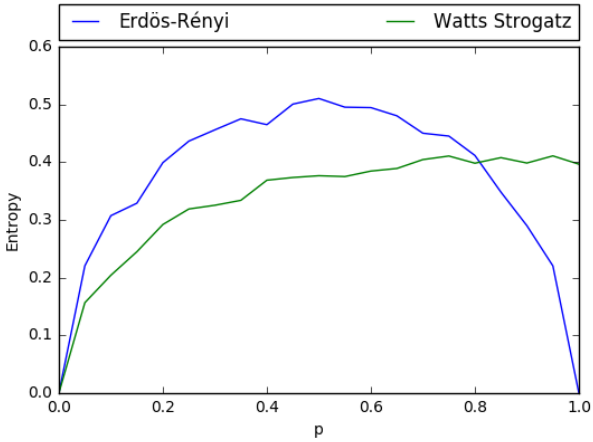

Fig. 4: TODO.

Appendix A
bla bla bla

[1] [2] [3] [4]

References

[1] Matthias Dehmer. “Information processing in complex networks: Graph entropy and information functionals”. In: *Applied Mathematics and Computation* 201.1 (2008), pp. 82–94.

[2] Matthias Dehmer and Abbe Mowshowitz. “A history of graph entropy measures”. In: *Information Sciences* 181.1 (2011), pp. 57–78.

[3] Paul Erdős and Alfréd Rényi. “On random graphs, I”. In: *Publicationes Mathematicae (Debrecen)* 6 (1959), pp. 290–297.

[4] Edward Casey Kenley and Young-Rae Cho. “Entropy-based graph clustering: Application to biological and social networks”. In: *2011 IEEE 11th International Conference on Data Mining*. IEEE. 2011, pp. 1116–1121.