Talk 1: Coding Bienaymé-Galton-Watson trees by random walks

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Reference material

[Cur]: Sections 4.1, 4.2.1, 4.2.2, 3.2, 3.3

Goal

The goal is to introduce a model of random plane trees, called Bienaymé–Galton–Watson trees, to explain how one can code them by conditioned random walks and see how the so-called Cycle lemma can be used to study them.

Content

- Definitions of plane trees and Bienaymé–Galton–Watson trees (Section 4.1)
- Definition of the Lukasiewicz walk (Section 4.2.1) and the connection with random walks (Proposition 4.2)
- Extinction probability (Theorem 4.3) with its more "standard" proof.
- The cycle lemma (Section 3.2)
- Kemperman's formula (Proposition 3.4)

References

[Cur] Nicolas Curien. A random walk among random graphs (lecture notes). https://www.dropbox.com/scl/fi/xgb6yed67rzwynauuuagy/cours-GA-online.pdf?rlkey=e10jhac0y9s49ly331il4ydjq&dl=0.