# Variable aggregation and (broadcasting) networks.

Human behaviour is not as stupid as Google tell us Mauro Faccin<sup>1,2</sup>, Michael Schaub<sup>3,4</sup>, and JC Delvenne<sup>1,5</sup>

# The Problem

- The web portal of a broadcasting networks (from Belgium)
- The paths of users browsing over webpage sections

## In this work...

We use tools from Information Theory and Network Science to analyse such system. We show that:

- the browsing behaviour (of a web portal user) is non-Markovian.
- the partition of such system can take into account the dynamical dimension to complement the classical approach to community/block detection



### Time Complexity (Entrogram)

The complexity of the system is captured by the following histogram which we call Entrogram<sup>a</sup>:



The browsing behaviour of users is **non-Markovian** as each [] depends on the previous **history** of the user web browsing.

Maximize:



# **Classic Community Detection**

(modularity maximization)

The classical community detection approach detects connection patterns

- News
- Radio + Tv (everything)
- Culture
- Sports



CCS/ITALY **ITALIAN REGIONAL** CONFERENCE ON COMPLEX SYSTEMS

- 1. ICTEAM, Universite Catholique de Louvain, Belgium,
- 2. ARC<sup>2</sup>S, Informatics Department, University of Turin, Itay
- 3. IDSS Institute for Data, Systems, and Society, Massachusetts Institute of Technology
- 4. Department of Engineering Science, University of Oxford
- 5. CORE, Universite Catholique de Louvain, Belgium