

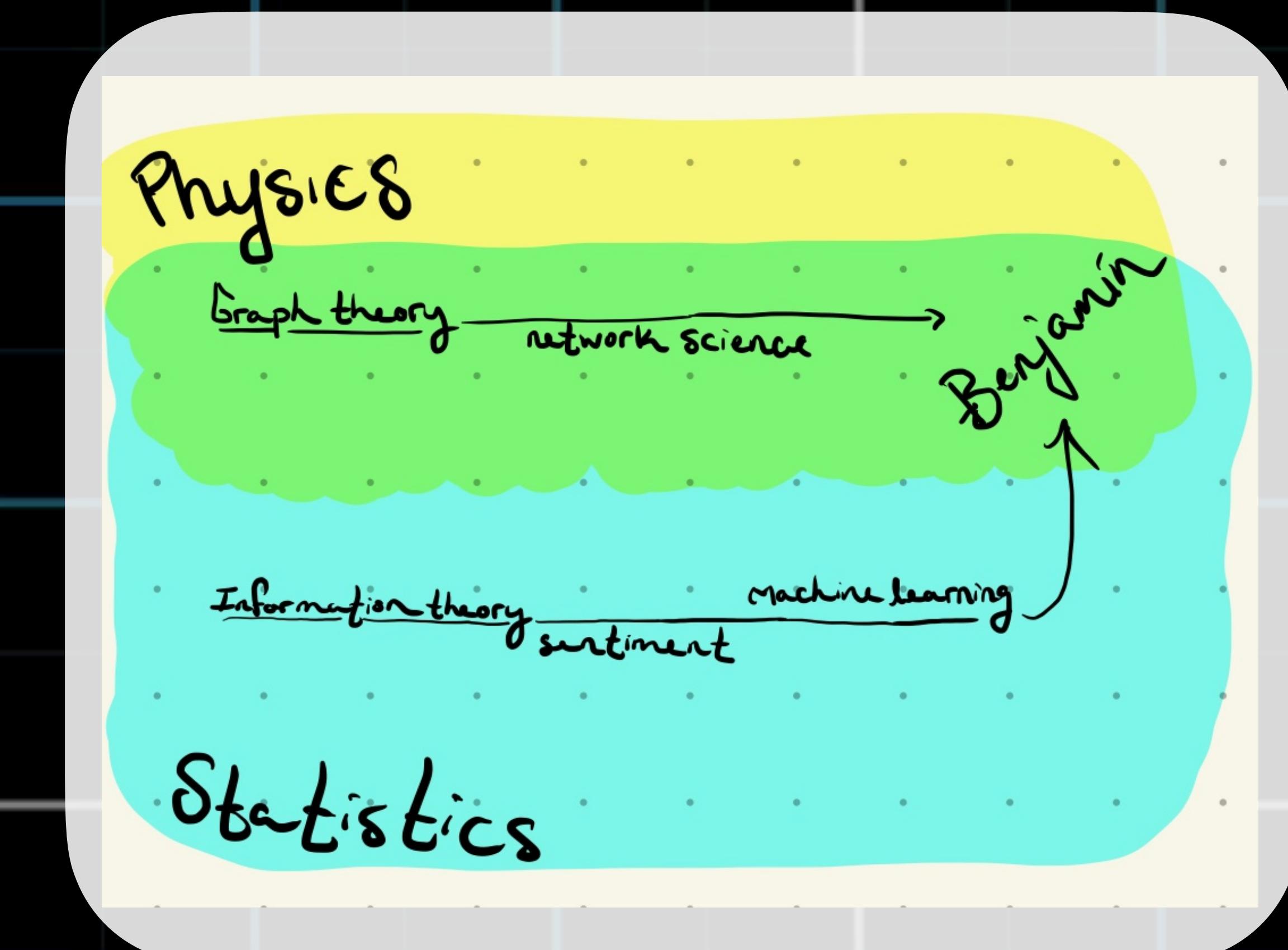
Theory Mapping

INFO 6101

Benjamin Freixas Emery / 2025-04-30

roadmap

- Natural language processing
 - Information theory
 - Sentiment
 - Machine learning
- Network science
 - Graph theory
 - and beyond
- 

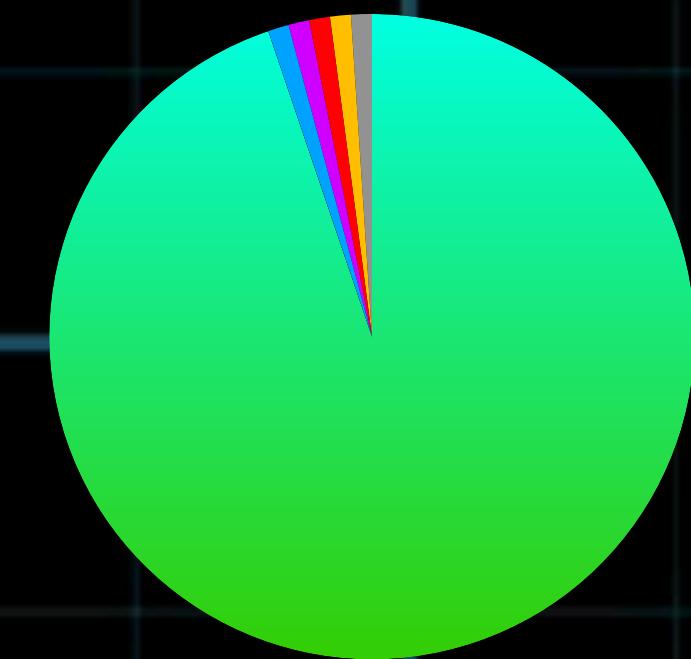


part 1

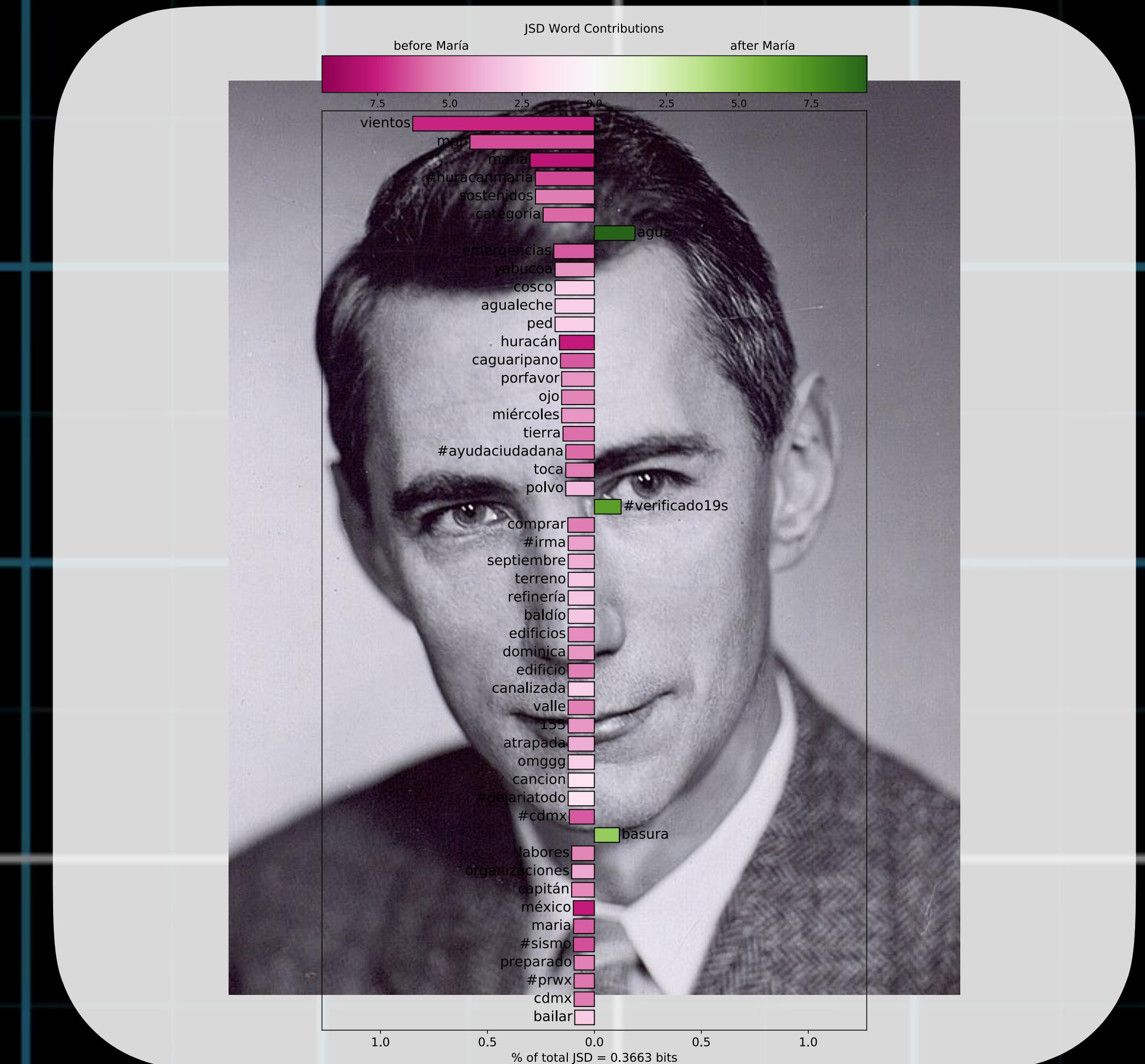
Natural language processing

NLP: Information theory

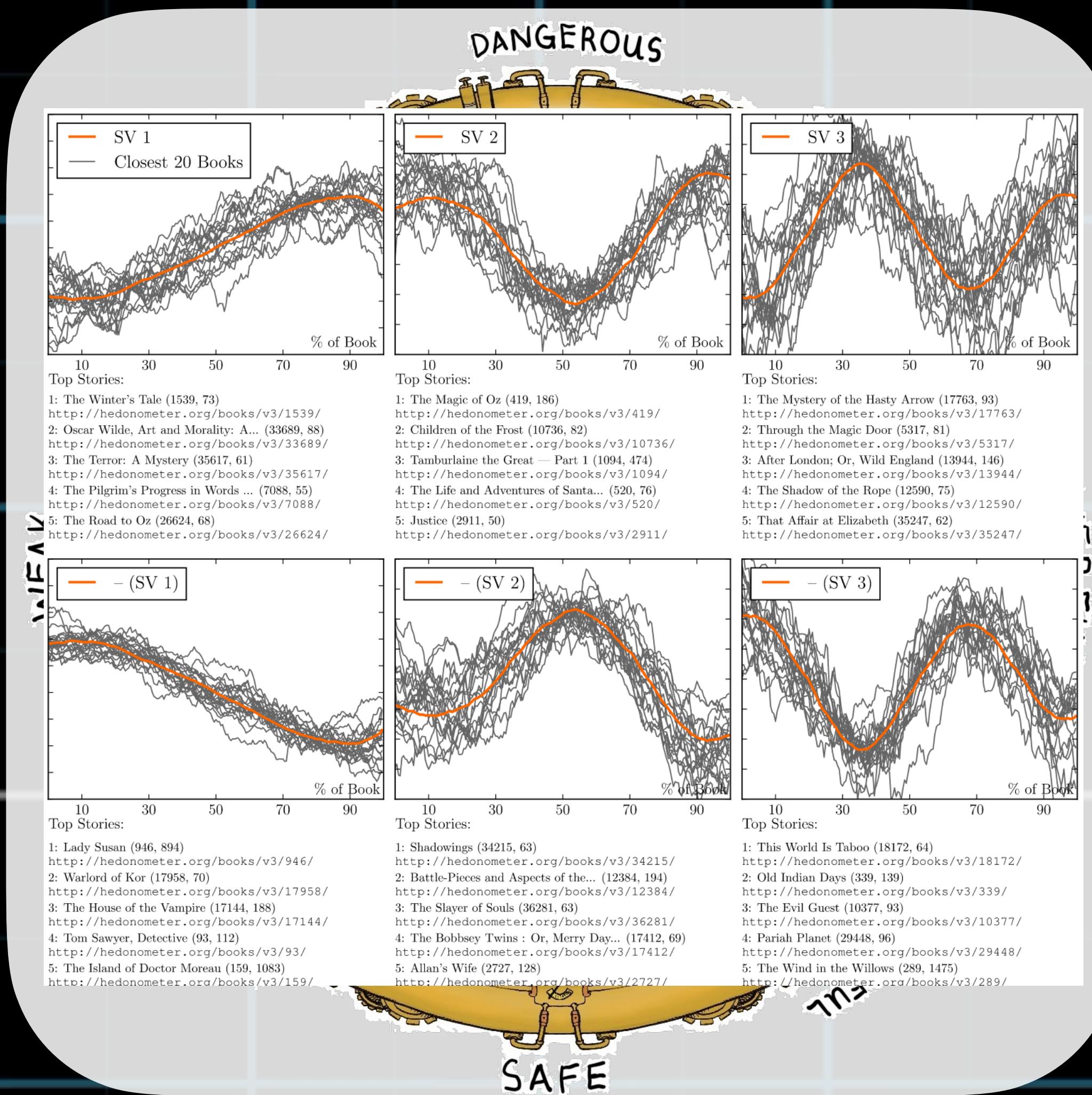
$$H(P) = - \sum_i^n p_i \log p_i$$



$$D_{KL}(P_1 || P_2) = \sum_i^n p_{1,i} \log\left(\frac{p_{1,i}}{p_{2,i}}\right)$$



NLP: Sentiment



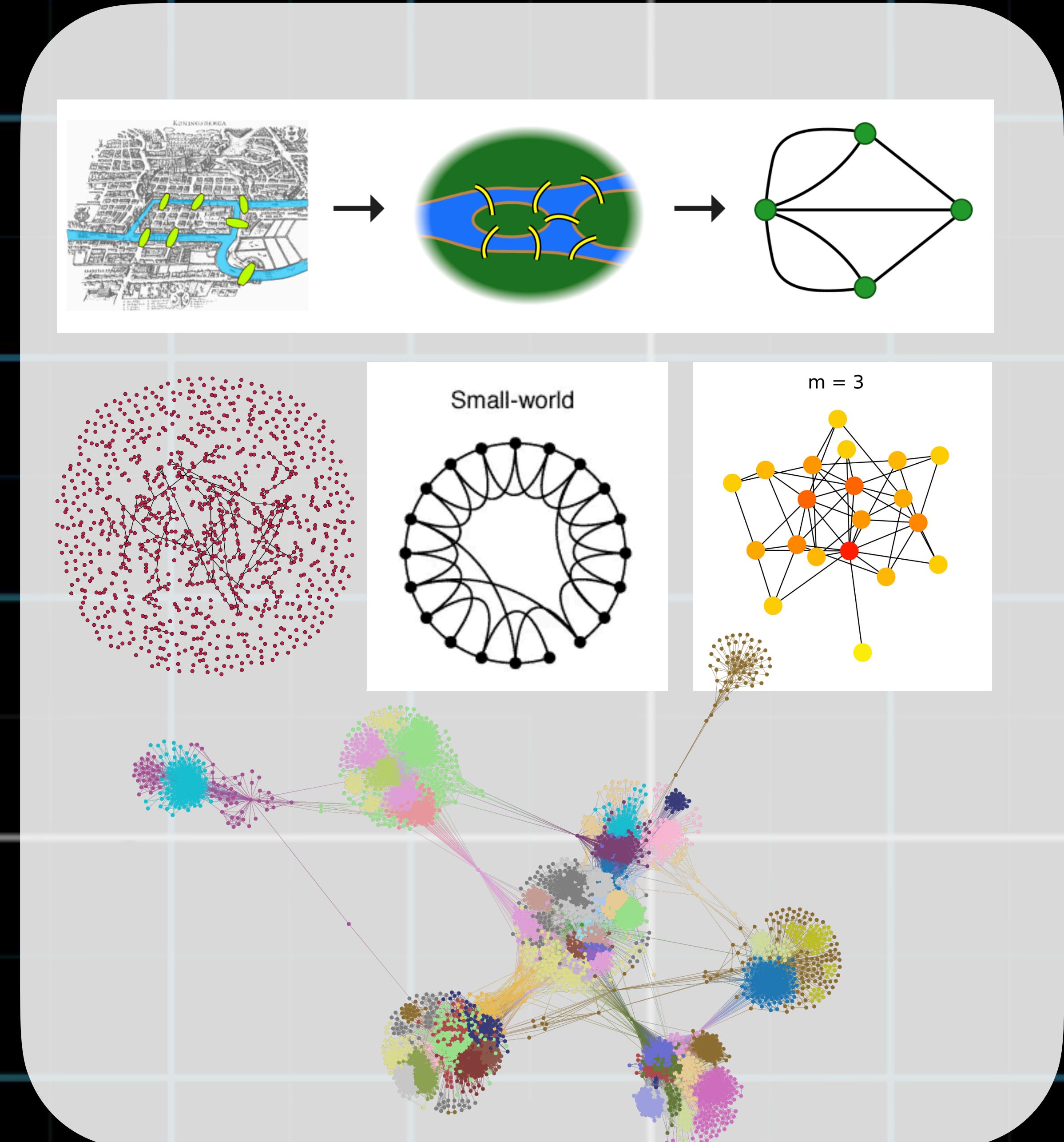
- Words have fundamental meaning
 - In the aggregate, the meaning of these words can reveal something about larger corpora
 - Universal positivity bias (Dodds et al.)
 - Shapes of stories (Reagan et al., Vonnegut)
 - Meaning can be along the valence axis, or others.
 - Valence-arousal-dominance (Tannenbaum et al., Mohammad et al.)
 - Power-danger-structure (Dodds et al.)

part 2

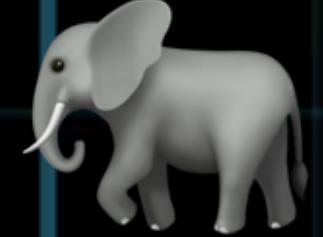
Network science

Network science

- Graph theory to netsci (Newman)
 - Euler
 - Erdos + Renyi
 - Watts + Strogatz
 - Barabasi + Albert
- Spreading models
 - Simple + complex contagion
 - Ising models
- Analysis methods
 - Degree distributions
 - Community detection



part 3



where's the social theory?

that's all