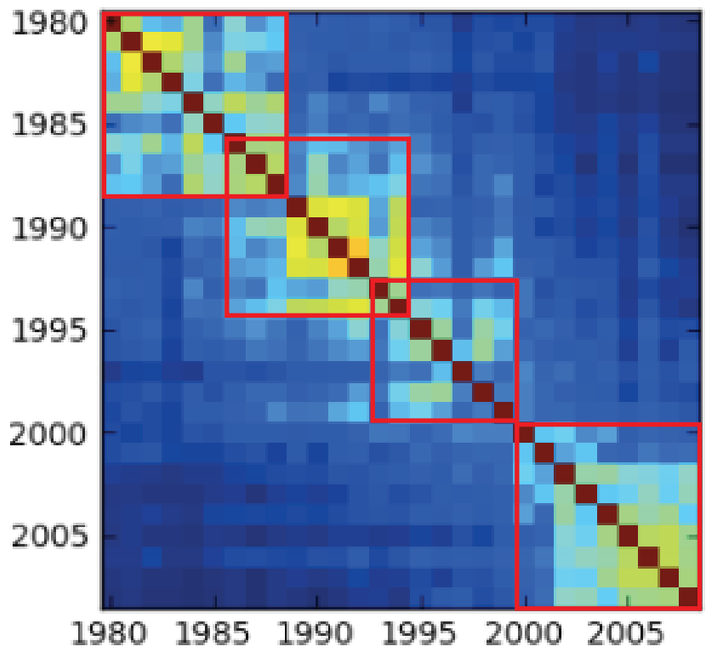
Appendix E : Inducing Temporal Structure on the Narrative



Narratives with a monotone direction of time-- such as sport/event reports, biographies and histories-- are so common. In this section, we show that the ontology based method can be enhanced to capture the direction of time. Although using the timestamp as a parameter enforces a temporal order to the traversal path, it does not change the community structure accordingly.

It turns out that for some datasets (especially those gathered over a long time), the data itself expresses a temporal community structure. In these cases, the obtained communities are representative of different eras of the evolution of the dataset.

The figure on the left which is taken from (Jurafski et. al. ACL-2012) shows a temporal community structure in the topics discussed in NLP papers between 1980-2008. It shows how four almost distinct eras can be detected by a community detection algorithm.

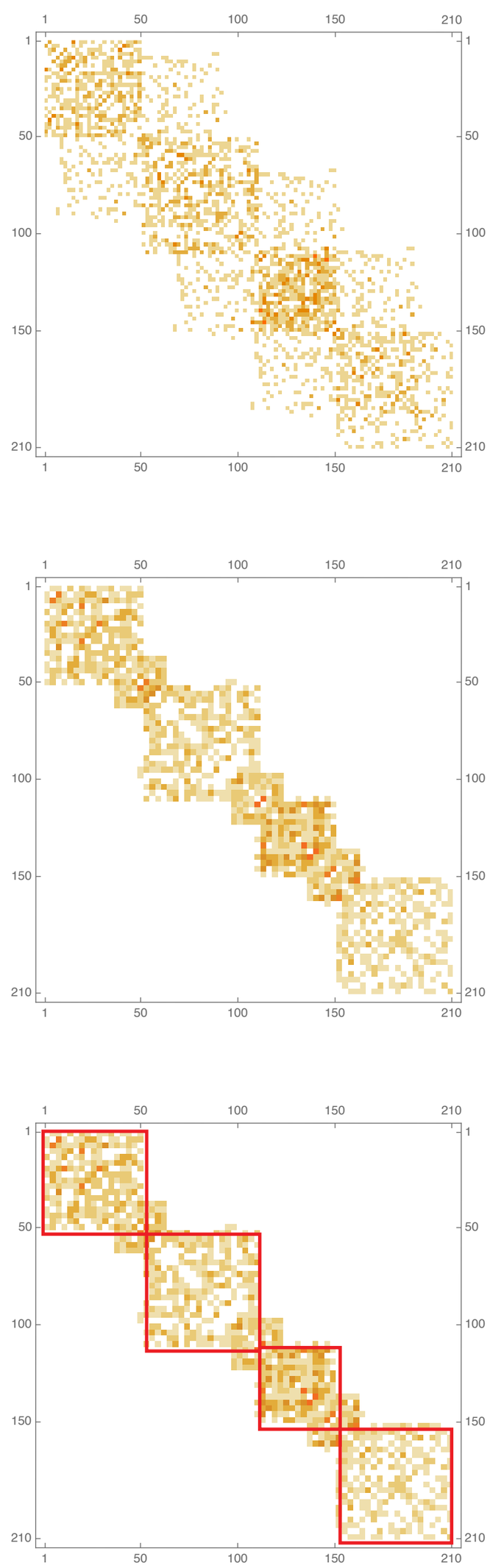
Here we demonstrate a basic trick in order to accentuate the temporal community structure. This can help one get a monotone narrative over time that abstracts and aggregates over major eras in the process.

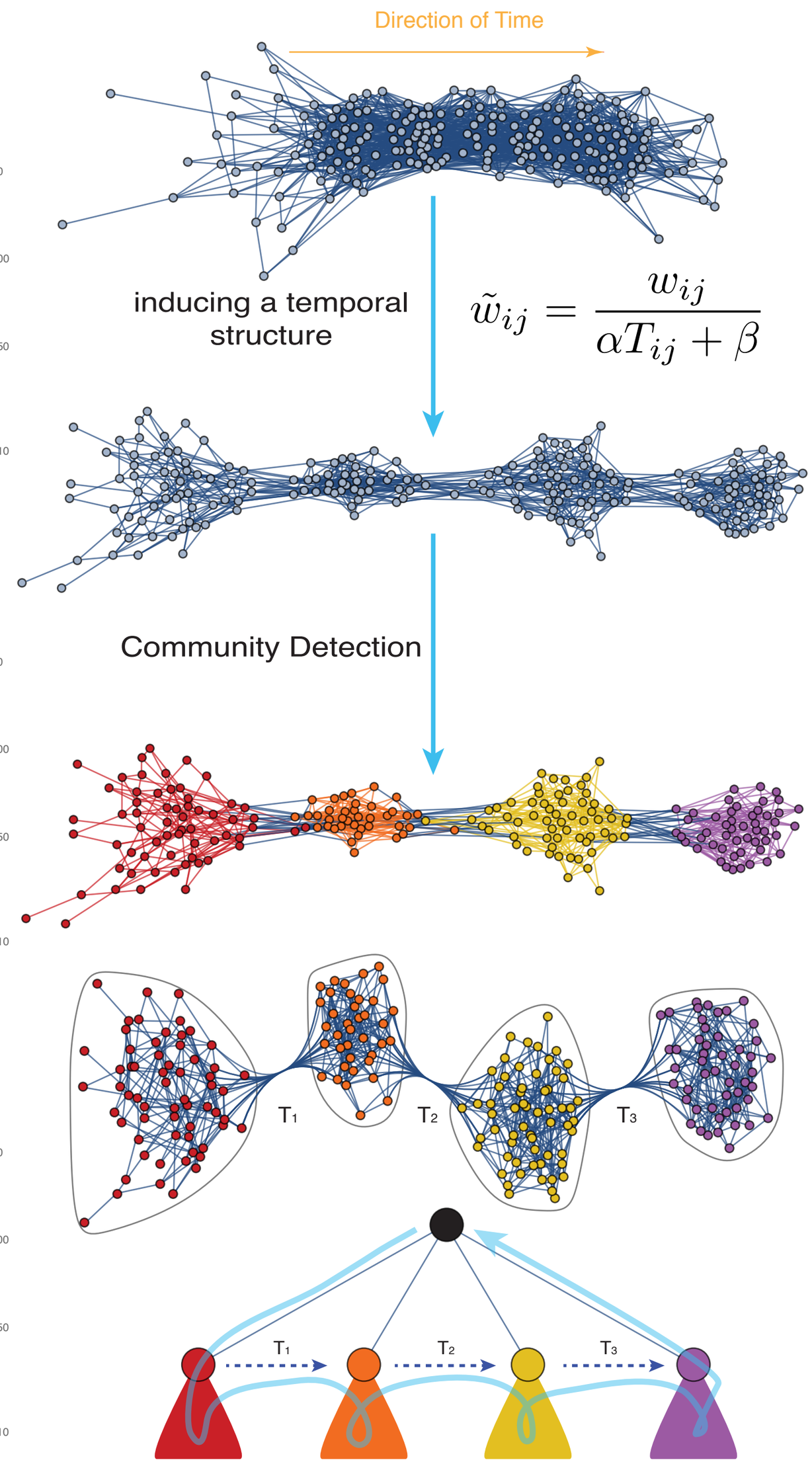
Imagine there is a network with a noisy sense of time. As depicted by the figure on the right, one can recognize different eras visually.
The idea is to penalize the weight of links based on their time distance. Therefore, the links between temporally neighbor nodes (nodes with close time stamp) will have higher weights than the others.

Even a simple linear penalization can improve the results dramatically. Here as we see the temporal structure of the network is accentuated after applying the penalization.

Now performing community detection gives a clean temporally ordered community structure.

Note that the first level jumps on the meta graph will correspond to paradigm shifts and can be interpreted specifically in the narrative.





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Facebook Fellowship Appendix E