

HOW TO IMPROVE INFORMATION SPREADING VIA THE CREATION OF SOCIAL GROUPS

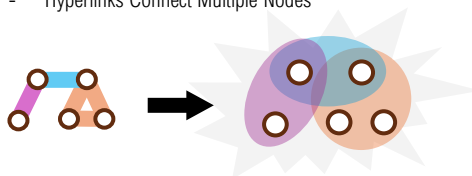
Improving SICP Spreading in Hypergraphs via Hyperlink Addition

BACKGROUND

How to model a social network?

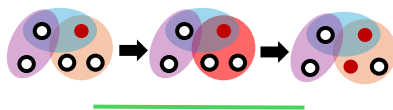
Hypergraphs

- Nodes and Hyperlinks
- Hyperlinks Connect Multiple Nodes



SICP

- Nodes are Susceptible or Infected
- Every Timestep, an Infected node transmits over one of its hyperlinks
- Nodes in that hyperlink have a chance β of becoming Infected
- Number of Infected nodes represent spread



- Improve Spread of Information in Company or Societal Contexts
- Improved Understanding of Epidemic Behaviour

Why?

OUR HYPERLINK CREATION STRATEGIES



Node Infection Probability (NIP)

For a given timestep and β

Degree

Number of unique nodes that a node is connected to

Hyperdegree (IHD)

Number of hyperlinks of a node

Selection Strategy: Mins + Median



Selection Strategy: Mins



NIP / Hyperdegree (NIPHD)

Max-Min normalized

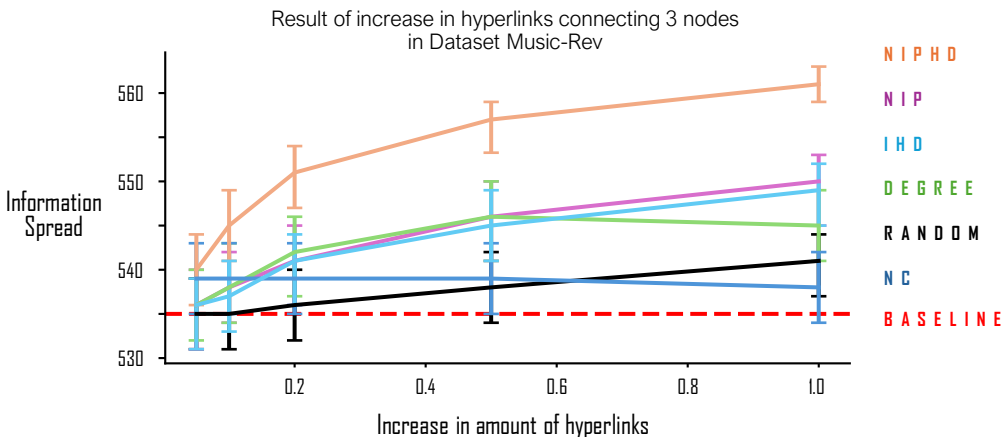
Neighbourhood Coefficient (NC)

Degree / Hyperdegree

Selection Strategy: Mins + Max



RESULTS



CONCLUSION

NIPHD performed best in almost all graphs

Relatively small increase

- < 10% when doubling number of hyperlinks
- Hypergraph dependent

Results are consistent with different β