Comparison of network complexity measures

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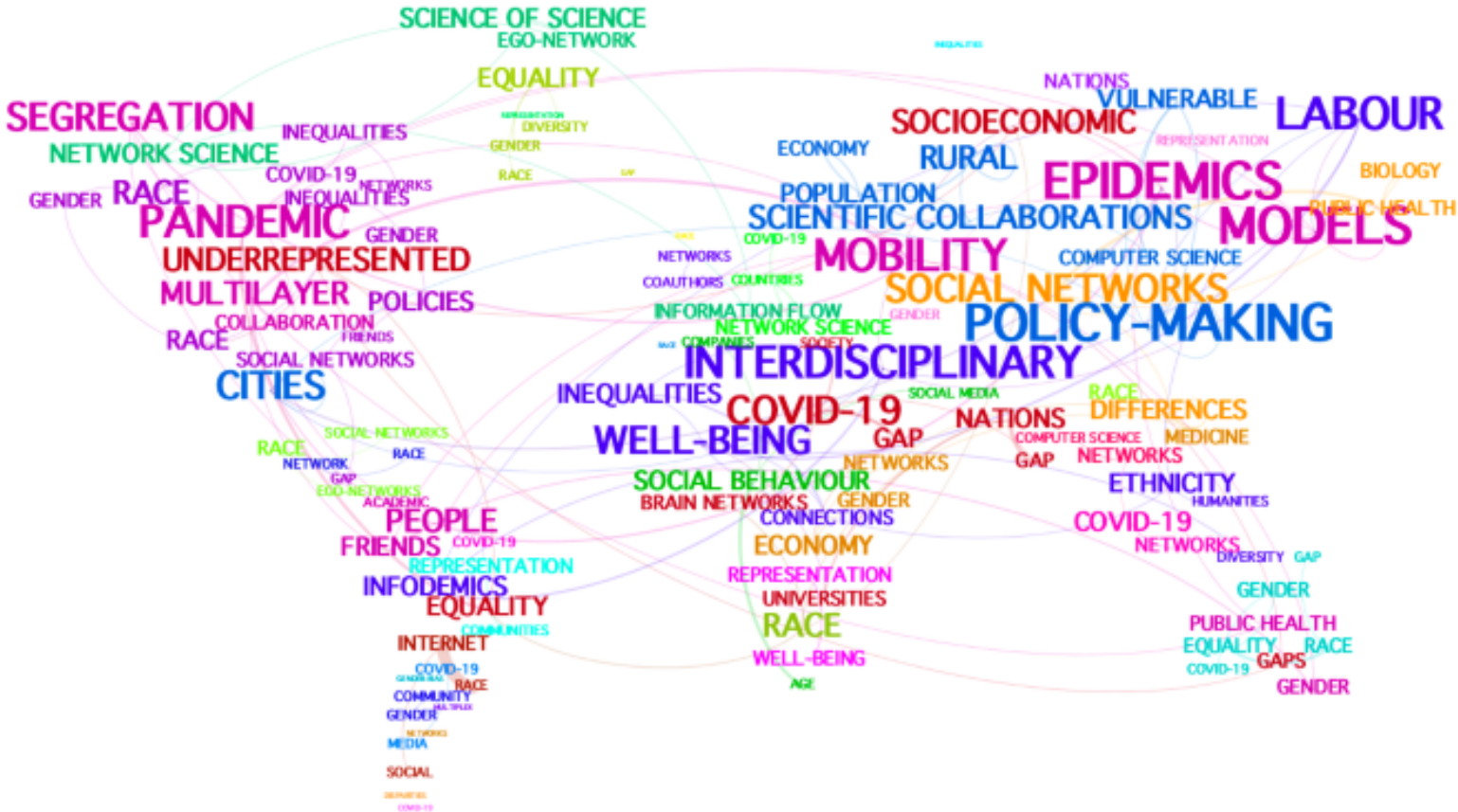
Network Science



Complexity measures

- Different subgraph measures
  - $C_{1e.st}$
  - $C_{1e,spec}$
  - $C_{2e,spec}$
- Product measures
  - MA_g
  - MA_{RI}
  - Cr
  - Ce
- Entropy measure
  - OdC

MA_{RI}

A product measure that is based on the idea of MA_g.

- Redundancy of a graph: $R = \frac{1}{m} \sum_{i,j>i} ln(d_i d_j)$
- Mutual information of a graph: $I = \frac{1}{m} \sum_{i,j>i} ln(\frac{2m}{d_i d_j})$
- Highest redundancy: $R_{clique} = 2ln(n-1)$
- Lowest redundancy: $R_{path} = 2(\frac{n-2}{n-1})ln(2)$
- Highest mutual information: $I_{path} = ln(n-1) - (\frac{n-3}{n-1})ln2$
- Lowest mutual information: $I_{clique} = ln(\frac{n}{n-1})$
- $C = (R - R_{path})(I - I_{clique})$

Result

Conclusion

Reference

1. https://appliednetsci.springeropen.com/networked-inequality–studies-on-diversity-and-marginalization