TODO

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Abstract

1 Algorithm notes

- Graph convolution:

$$h_{v_i}^{(l+1)} = softmax(\sum_{j \in N_i} h_{v_j}^{(l)}) \tag{1}$$

  with N_i the infection-weighted neighbours of node v_i.

- From A and I where I is the infection matrix.

  - The infection matrix as

  $$I = \begin{pmatrix} 0 & 0 & p_a & 0 \\ 0 & 0 & p_a & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \tag{2}$$

  with I_{ij} so that i corresponds to host and j to contact person and ordering unknown, susceptible, infected, recovered. p_a denotes the probability of infection (also known as attack rate) after contact.

  - The adjacency matrix A is time dependent, $A(t)$, and inferred from data. In our use case, $A_{ij} = 1$ if nodes v_i and v_j, hence persons i and j, have been in contact. This corresponds to $dist(v_i, v_j) \leq \epsilon$ with $\epsilon = 0$ in the discrete case that we consider here.