

Number of neurons in i -th class

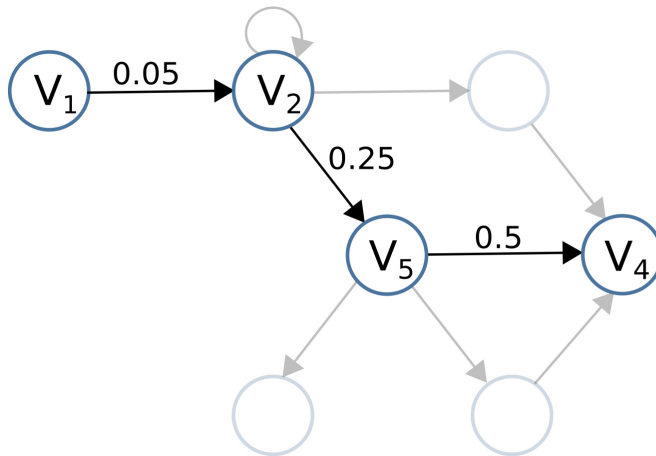
i	$ V_i $	$ \tilde{V}_i $
1	1000	10
2	250	2.5
3	100	1
4	500	5
5	300	3
6	400	4
7	150	1.5

Block connection prob. p_{ij}

0	0.05	0	0	0	0	0
0	0.1	0.3	0	0.25	0	0
0	0	0	0.1	0	0	0
0	0	0	0	0	0	0
0	0	0	0.5	0	0.2	0.4
0	0	0	0.15	0	0	0
0	0	0	0	0	0	0

Cost $c_{ij} := \frac{1}{p_{ij}|\tilde{V}_i||\tilde{V}_j|}$

0	0.8	0	0	0	0	0
0	0	1.33	0	0.53	0	0
0	0	0	2	0	0	0
0	0	0	0	0	0	0
0	0	0	0.13	0	0.42	0.56
0	0	0	0.33	0	0	0
0	0	0	0	0	0	0



Path:

$$\mathcal{P} = \{V_1, V_2, V_5, V_4\}$$

Path length:

$$\begin{aligned}
 \ell(\mathcal{P}) &= c_{12} + c_{25} + c_{54} \\
 &= 0.8 + 0.53 + 0.42 \\
 &= 1.75
 \end{aligned}$$

Figure S1: A simple example illustrating how the path length of a random walk is calculated, using a mock circuit with seven classes (blocks). The number of neurons in each class $|V_i|$, and directional edge weights between classes p_{ij} are assumed to be known — which are used to calculate the cost c_{ij} of each random step in the walk. The path length for the random walk $V_1 \rightarrow V_2 \rightarrow V_5 \rightarrow V_4$ is then obtained by summing the costs along the traversed path.