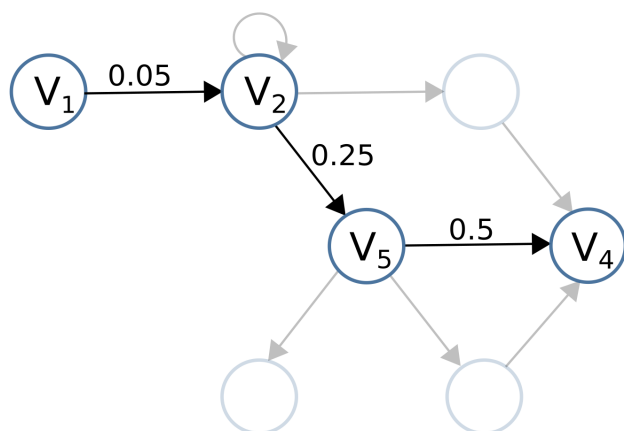


Block connection prob. p_{ij}

| | | | | | | |
|---|------|-----|------|------|-----|-----|
| 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 ($V_1 \rightarrow V_2 \rightarrow V_5 \rightarrow V_4$) is calculated on a mock circuit consisting of just 6 classes (blocks). The edge weights and number of neurons in each class are assumed to be known, which are in-turn used to calculate the cost of each random step in the walk. The path length for the random walk is then obtained by summing the costs along the traversed path.