1

STRUCTURAL ASPECTS

Subjecting the anisotropic network model to a critical examination of its structural features, we identify prevalent patterns of connectivity and relate theoretical and computational results to findings from experiments in the rat's visual cortex.

Small-world networks, as described in Section **??**, are characterized by small a average path length and comparably high clustering coefficient. In the of brain networks, small-world

(Watts and Strogatz 1998)

Here we are interested in exploring the question if network anisotropy has effect on the small-worldness of geometric networks. Using distance-dependent networks as a reference, we find that eliminating anisotropy through rewiring does affect the small-world properties to some degree; with rising isotropy in the network, the characteristic path length declines, while the network clustering coefficient increases resulting together in rewired networks to display a higher degree of small-worldness (Figure 1.1).

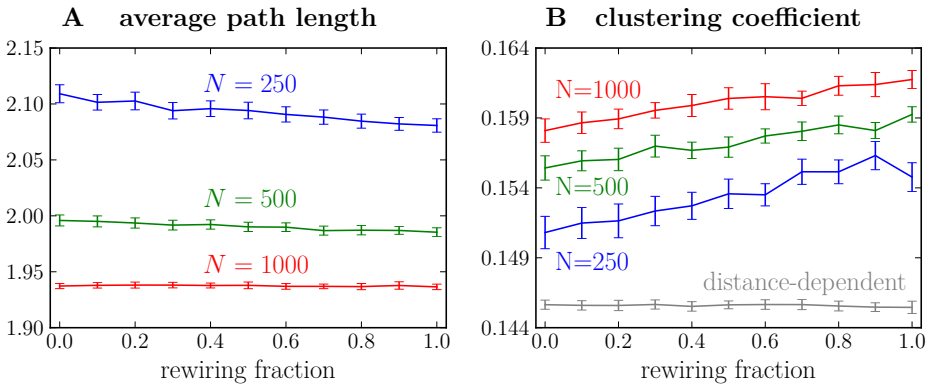

Figure 1.1: Higher degree of small-worldness in isotropic than in anisotropic networks Generating anisotropic networks with different axon widths w and extracting probability p of dcirected connectin between two random nodes, demonstrates the dependency of p on the width parameter w. **A)** At an axon width of over $w = 100$, exceeding the square's side length, the connection probability saturates at $p = 0.5$, as axon bands are essentially "cutting" the square in a connected and unconnected half (`c5b64f3e`). **B)** For small w the connection probability is a linear function of w, allowing the width $w_S/2$ at which $p(w_S) = 11.6$ to be determined by a linear fit as $w_S/2 = 12.6$ (`064f9b10`).

In ER networks avg and cc are ...

Comparing path length we find ...

The analysis . Here we present the influence on anisotropy of

Charactersitic path length

Average path length and so forth

Sporns papers newest Butz

While the transitivity ratio of a network, its correlation with the network's anisotropy degree gives hint of deeper structural relationships found in the subsequent sections.

1.2 TWO NEURON CONNECTIONS

Connectivity in cortical neural networks shows a specific . First described by Markram 1997, finding across have confirmed .

A first result

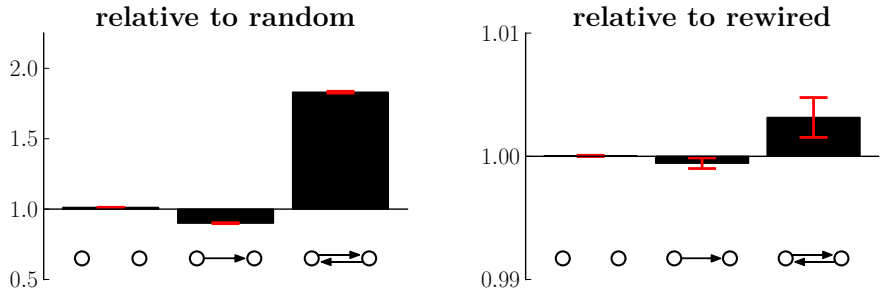

Figure 1.2: Title SEM! (`c5f1462b`).