1

STRUCTURAL ASPECTS

In this chapter we analyze the strucarl. The term motif referes to... . Studies of Song et al. (2005) and Perin et al. (2011) show stuff. Pernice2011, Sporns , Zhao2011.

Three-neuron patterns

Here we investigate the occurrence of three-neuron patterns in the anisotropic networks. Song et al. (2005) did this study .

In comparison

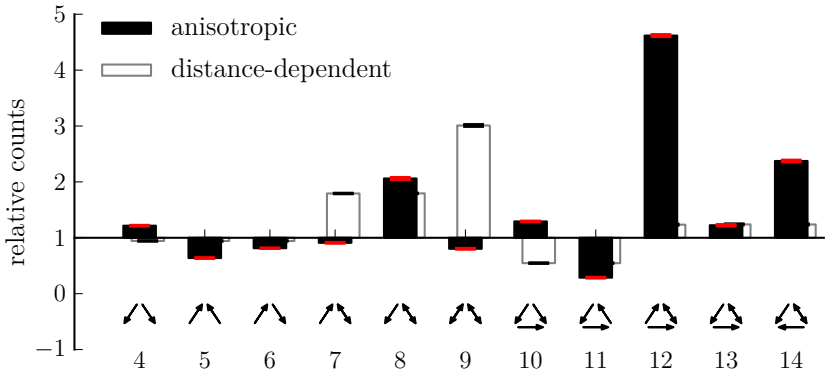

Figure 1.1: Relative occurrence of three-neuron patterns Extracting the counts of three-node motifs in anisotropic (filled bars) and distance-dependent networks (unfilled bars), the quotient of the obtained count with the number of occurrences expected from the two-neuron connection probabilities in the networks (rs =, „ cf.) shows the over- and underrepresentation of specific motifs in the network (red and black errorbars are SEM). In anisotropic networks pattern number "12", for example, appears around five times more often than we would expect from the occurrence two-neuron connections. The relative counts for anisotropic networks resemble the findings of Song et al. (2005) and differ significantly from the counts in distance-dependent networks, implying that anisotropy has a strong influence on the relative occurrence of three-neuron patterns. (`4839ce41`)

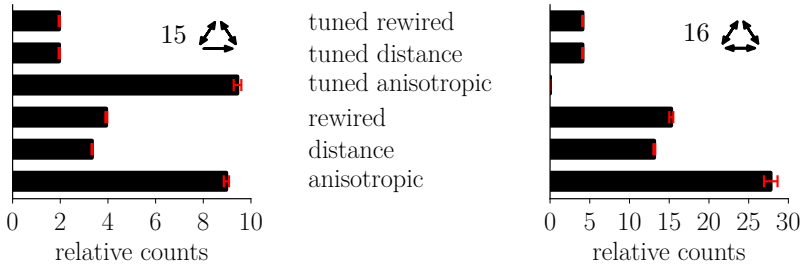

Figure 1.2: Distance-independent overrepresentation of reciprocal connections Compaison of occurrences of one- and bidirectionally connected neuron apairs in the tuned anisotropic networks (gray) with profiles found by Perin et al. (red), shows that overrepresentation of bidirectional pairs is distance-independent and not connected to anisotropy. **A)** Overall connection probability. (875505b0)

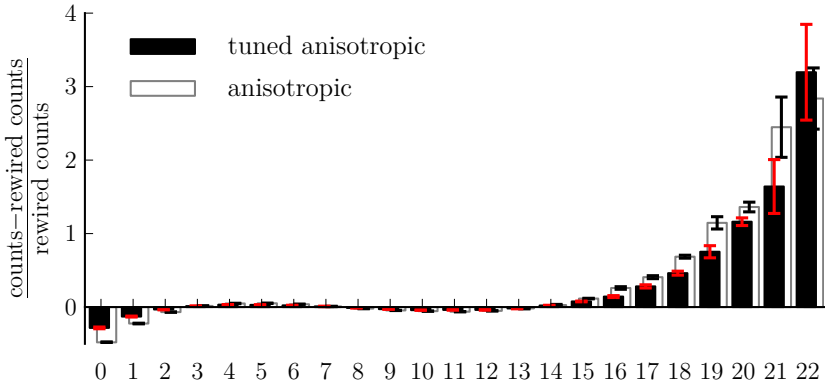

Figure 1.3: Relative occurrence of three-neuron patterns Extracting the counts of three-node motifs in anisotropic (filled bars) and distance-adependent networks (unfilled bars), the quotient of the obtained count with the number of occurrences expected from the two-neuron onnection probabilities in the networks (rs =, „ cfsdfg.) shows the over- and underrepresentation of specific motifs in the network (red and black errorbars are SEM). In anisotropic networks pattern number "12", for example, appears around five times more often than we would expect from the occurrele the findings of Song et al. (2005) and differ significantly from the counts in distance-dependent networks, implying that anisotropy has a strong influence on the relative occurrence of three-neuron patterns. (4839ce41)

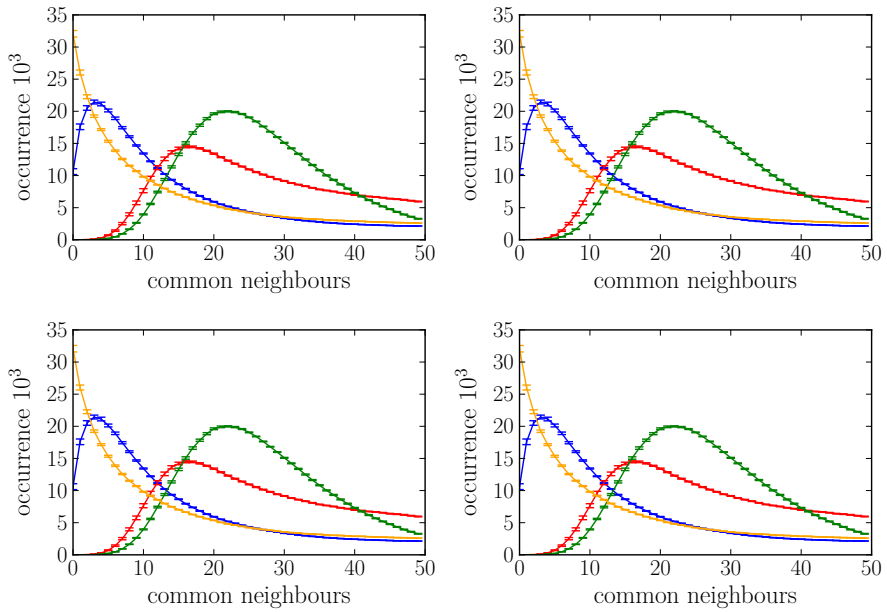

Figure 1.4: In-degxree distrbution not affected by varying degrees of anisotropy (77995b6b).