



Seminar/Talk

Statistical inference of circuit motifs in biological neural networks

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Host:

Physical and functional constraints on biological networks lead to structural patterns across multiple scales in their organization. A particular type of higher-order network feature that has received considerable interest is network motifs, defined as statistically regular subgraphs. These may implement fundamental logical and computational circuits and are referred to as building blocks of complex networks. Their well-defined structures and small sizes also enable the testing of their functions in synthetic and natural biological experiments. I will present an inference framework for motif mining based on lossless network compression. This provides an alternative definition of motif significance which allows comparing different motifs and selecting the collectively most significant set of motifs as well as other prominent network features in terms of their combined compression of the network. This approach overcomes common problems in hypothesis testing-based motif analysis and guarantees robust statistical inference. I will show how this applies to neural wiring diagrams, termed connectomes, including the nematode *Caenorhabditis elegans* and the fruit fly *Drosophila melanogaster* at different developmental stages.

Friday, February 7, 2025 03:00pm - 04:00pm

Mondi Seminar Room 2, Central Building



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

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