Colloquium

The Institute Colloquium: TBA

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Host:

Information is carried in the brain by the joint electrical spiking patterns of large groups of neurons, also known as the "neural code". The response of neurons to repeated stimuli is surprisingly unreliable. The noisy nature of neurons limits the capacity of spiking patterns to convey information, and how it can be read by the brain. To accurately decode the joint activity of neurons, the brain must overcome this noise and identify which patterns are semantically similar. We show that, in the vertebrate retina, accurate models of network noise allow us to build a neural thesaurus, measuring the similarity between population responses to visual stimuli based on the content they carry. This thesaurus reveals that the neural code is organized in clusters of synonym-like patterns that are similar in meaning, but may appear different syntactically. This structure is highly reminiscent of the codebook organization of engineered codes. We suggest that the brain may use this structure, and show how it allows the accurate decoding of novel stimuli from novel spiking patterns.

Monday, January 28, 2013 04:30pm - 05:30pm
Raiffeisen Lecture Hall, Central Building

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