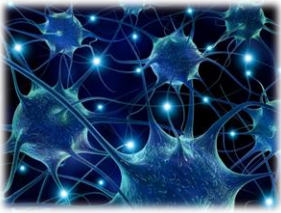




Forum

Towards predictive and scaled-up neural network models of brains



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Abstract:

Artificial neural networks have been used as computational models for many brain functions, including perception, cognition, navigation, and motion. In this talk, I will present some results exploring the extent to which we can use these computational models to make precise predictions about neural circuits, and how we can scale up this modeling paradigm. In the first part of the talk, I will show results using neural networks modeling olfactory circuits in fruit fly. Neural networks trained on an olfaction-inspired task can quantitatively recapitulate neural connectivity in fruit fly. These results prompt us to make predictions about olfactory connectivity in a wide range of other species. In the second part of the talk, I will discuss how the now classical approach of modeling cognition with recurrent neural networks can--and should--be scaled up with open exchange of task, data, and analysis. In particular, I will present NeuroGym, an open resource for sharing neuroscience tasks that can facilitate high throughput development, verification, and falsification of neural network models.

Host: Rei Akaishi, Social Value Decision Making Unit, RIKEN CBS-TOYOTA Collaboration Center

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