CMCF and CCBS Seminar Series

NSF-Simons Center for Multiscale Cell Fate Research
UC Irvine

Efficient computational modeling of cortical circuits via coarse-grained interactions

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Biologically realistic models of cortical circuits are challenging to build, tune, and analyze due to the large numbers of neurons and their complex interactions. Reduced, or coarse-grained, models are more tractable, but there is a nontrivial trade-off between tractability and biological fidelity / interpretability. In this talk, I will describe a coarse-graining strategy inspired by ideas from nonequilibrium statistical mechanics. The aim is to balance biological realism and computational efficiency. I will illustrate how this strategy applies to the primate primary visual cortex. This is joint work with Zhou-Cheng Xiao and Lai-Sang Young.