THE UNIVERSITY OF CHICAGO

Department of Statistics

SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR

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Evidence For and Against Attractor Models of Grid Cells

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ABSTRACT

The firing locations of a grid cell form a hexagonal pattern tessellating the environment in which an animal navigates. It is believed that these cells provide an internal metric for space and several continuous attractor models have been offered as neural implementations that may underly the generation of grid cells' spatial response properties. In this talk, I will discuss results from statistical analysis of the firing of grid cells and show that the general pattern of inferred functional connectivity in a population of grid cells is consistent with a continuous attractor network, but also that it is too noisy to be the only mechanism for generating stable grid cells. Furthermore, the spatial distribution of grid cell firing pattern exhibits inhomogeneities that require explanations that idealized continuous attractor network as currently implemented fail to provide.

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