



Séminaires ISIR

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Lundi 7 Octobre 2013 à 14h00

Campus Jussieu, 4 place Jussieu, Paris
Salle de réunion H20

Titre : Bilateral model of the neural integrator must have mutual inhibition to reproduce lesion behavior"
by Pierre M. Daye, Raphaël Jungers and Lance M. Optican

Résumé:

The nucleus prepositus hypoglossi (NPH) and the medial vestibular nuclei (MVN) are two brainstem areas that integrate the motor drive (representing the eye velocity) sent to the eye by the excitatory and inhibitory burst neurons IBNs and EBNs). They allow the eyes to remain stable at an eccentric position. The oculomotor integrator is not perfect; it leaks. A conductance-based model of the global input-output activity using only positive feedback has been proposed (Seung, 2000). However, this representation of NPH/MVN behavior is adequate for simple classes of models but can not reproduce some key behaviors of the neural integrator: 1) NPH/MVN are bilateral structures that work in push-pull. This means that the two sides are connected and interact. When one goes up, the other side goes down by the same amount. 2) Change of time constant. When the midline is cut, the time constant of the integrator gets shorter. This also shows that both sides are interacting to increase the global time constant of the system. In this presentation, we study a bilateral model of the NPH/MVN complex with conductance-based units and show what conditions must be met to reproduce lesion behavior.