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ORAL PRESENTATION Open Access

On the similarities of the insect brain and pattern recognition algorithms

Ramon Huerta

From 1st International Workshop on Odor Spaces
Hannover, Germany. 4-7 September 2013

We will describe the computational similarities between information processing in the insect brain and pattern recognition algorithms like support vector machines and the perceptron. The structural organization of the Mushroom bodies, the location of Hebbian learning, and the presence of inhibition can be framed in a convex optimization problem which is equivalent to the SVM. It is also noteworthy to show that simplified models of neurons can be mapped into realistic ones and vice versa. However, the mechanisms to keep the activity levels of neurons under controlled activity can be challenging in realistic neural networks, and perhaps this is the reason why there are some feedback control circuits in the Antennal Lobe and the Mushroom Bodies.

Published: 16 April 2014

doi:10.1186/2044-7248-3-S1-O16
Cite this article as: Huerta: On the similarities of the insect brain and pattern recognition algorithms. *Flavour* 2014 **3**(Suppl 1):O16.

BioCircuits Institute, University of California, San Diego La Jolla, CA 92093-0328, USA