ICTS Seminar

Title : A learning scheme for neural networks in the brain to predict and control body movement

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Date : Thursday, Aug 3, 2017

Time : 2:00 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : To plan and control movement, the brain must construct a model of the non-linear dynamics of the body in response to neuro-muscular commands. How a network of spiking neurons (in the brain) can learn such a model, by adjusting interconnection weights in a biologically plausible way, is still unresolved. As an advance in this direction, we propose a local and stable learning scheme, Feedback-based Online Local Learning Of Weights (FOLLOW) [Gilra and Gerstner, arXiv:1702.06463]. We show that the learning scheme is uniformly stable with the error going to zero asymptotically, under reasonable approximations. We apply the FOLLOW scheme to enable a network of interconnected spiking neurons to learn the dynamics of a linear, non-linear or chaotic example system. We also make the network learn the dynamics of a simplified two-link arm, then use the network to control the arm, to draw a desired shape on a wall. Ongoing extensions will also be discussed.