INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study	:	**Ph.D.**

Thesis Title: **Immuno-Inspired Embodied Lifelong Learning in Robots**

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SHORT ABSTRACT

The work describes the formulation of immuno-inspired mechanisms to continuously evolve, cache, manage and evict several Artificial Neural Network (ANN) based robot controllers, within disparate *Halls-of-Fame*, thereby facilitating Embodied Life-long learning in robots. The work also introduces a novel concept termed *Mutational Puissance* to enhance learning in ANN based controllers that use neuro-evolution. Further, unlike the conventional layer-wise transfers conducted in ANN-based Transfer Learning, a new immunology inspired *Neuronal-level Transfer Learning* technique has also been described. The technique aids in identifying neurons that play a more significant role during the learning phase. These, so-called, *hot neurons*, when transferred to target ANNs hasten learning convergence, especially when the source and target dataset domains are dissimilar. Transfer of such neurons has also proved to be effective while learning in scenarios involving robots.