

## **The insect brain as a model system for smart neuromorphic architectures for the edge**

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Insects are a fantastic example of autonomous agents capable of interacting with a noisy, unpredictable environment, learning complex tasks and the semantic meaning of inputs using only a few examples, and integrating inputs from multiple streams, in a resource constrained setting. Equally importantly, their size puts them within reach of existing semiconductor processing capabilities. This makes them a great model system to explore how neuromorphic computing approaches can enable smart sensors and autonomous systems at the edge. In this presentation I will focus on key design principles of the insect brain, how they map with current domains in AI/machine learning, and how we can efficiently explore the design space of the resulting architectures in the context of realistic applications such as online reinforcement learning, the online processing of RF signals, or smart detectors for high energy physics. Finally I will point out to existing gaps in neuroscience that could help us better understand how to develop such architectures.

This work has been supported through DARPA's Lifelong Learning Machines program, Argonne's LDRD program, and DOE Office of Science.