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Presentation Abstract

Program#/Poster#: 797.12/C12

Presentation Title: Developing an open source model for studying embodied cognition and its relationship to spatial neural networks

Location: Halls B-H

Presentation time: Wednesday, Nov 13, 2013, 4:00 PM - 5:00 PM

Topic: ++A.10.a. Evolution of developmental mechanisms

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Abstract: Embodied modeling and neural networks have previously been used by our group to further understand epilepsy, a condition in which changes in network dynamics can affect cognition and behavior. Building these embodied agents, however, can become increasingly expensive and existing hardware is often proprietary and customized for specific purposes. This study aims to provide an open source platform to facilitate work on embodied modeling projects that connect to neural networks. In particular, the Arduino platform is used to create an autonomous agent with evolving neural networks and to observe its subsequent course of action. The Arduino platform is a widely used open source platform with abundant documentation and available toolkits. Different sensors and actuators, including photoresistors, touch switches and servo motors, can be implemented and easily interfaced with existing modeling libraries. Keeping a green perspective in mind, RoHS compliant materials were used in building the embodied agent. We demonstrate that the use of an open source platform to study embodied neuroscience offers an alternative approach to gathering important data in the field of evolutionary autonomous agents and to understanding the relationship between network structure and behavior.

Disclosures: **A.K. Lee:** None. **A. Lam:** None. **E.L. Ohayon:** None.

Keyword(s): embodied agents

COMPUTATIONAL MODEL

evolutionary autonomous agent

Support: CIHR