The Department of Computer Science

University of Nevada, Reno

cordially invites you to a Master's colloquium

Design and Implementation of a Hierarchical Robotic System: A platform for Artificial Intelligence Investigation

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science
with a major in Computer Engineering.

by

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Abstract: Robots need to act in the real world, but they are constrained by weight, power, and computation capability. Artificial intelligence (AI) techniques try to mimic the clever processing of living creatures, but they lack of a body and a realistic environment. In this thesis we introduce a novel robotic architecture that provides limber robots with massive processing and parallel computation potential. This platform allows researching and developing AI models (the brain) in interaction with its body and environment. Our robotic system distributes the processing on three biologically correlated layers: the Body, Brainstem, and Cortex; on board the robot, on a local PC, and on a remote parallel supercomputer, respectively. On each layer we implemented a series of intelligent functions with different computational complexity, including, a sound localization system, a bimodal speech approach recognition using artificial neural networks, and the simulation of biologically realistic spiking neural networks for bimodal speech perception.

3:00 pm, Monday, November 24, 2003

Room 234, Srcrugham Engineering and Mines (SEM)

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