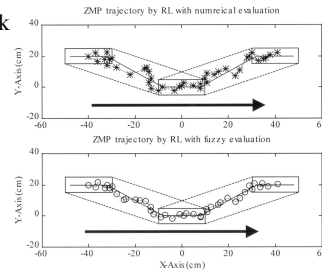# Learning 2
Chairs: Koji Ito, C. S. George Lee

Reinforcement Learning with Fuzzy Evaluative Feedback for a Biped Robot
C. Zhou and Q. Meng
Singapore Polytechnic
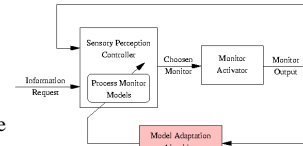
- Why fuzzy evaluative feedback for biped learning.

- Fuzzy reinforcement learning (FRL) .

- Biped gait synthesis based on FRL.

- Simulation results.

Learning and Adaptation of Sensory Perception Models in Robotic Systems
T. Celinski and B. McCarragher
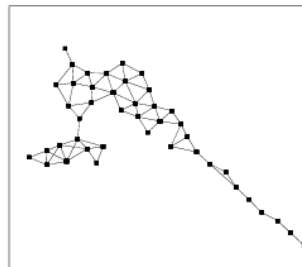Australian National University

- Adaptive Control of Perception Requires Good Perception Models

- Good Perception Models Can Be Achieved Through Adaptation

- Radial Basis Functions Over Fixed-Size Grids Allow Real-Time Model Adaptation

- Applicable to Sensory Systems with Time-Varying Characteristics

Learning Globally Consistent Maps by Relaxation
Tom Duckett[1], Stephen Marsland[2] and Jonathan Shapiro[2]
[1]University of Orebro and [2]University of Manchester

- Fast, on-line map learning algorithm

- Generates geometrically consistent maps

- Proven to converge to a globally optimal solution

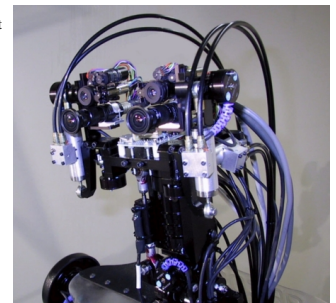- Experiments in large, real world environments

Fast Learning of Biomimetic Oculomotor Control with Nonparametric Regression Networks
T. Shibata[1] and S. Schaal[2]
[1]Japan Science and Technology Corporation and [2]The University of Southern California

- Learning accurate oculomotor reflexes for visual stabilization during body-movement

- Combining a biologically inspired cerebellar learning scheme with a state-of-the-art statistical learning network

- Using a biomimetic active vision system on our humanoid robot, accurate stabilization reflexes are learned in less than 60 seconds

- Biomimetic learning and control circuits combined with modern statistical learning methods lead to autonomous acquisition of high performance oculomotor control

Evolution Based Virtual Training in Extracting Fuzzy Knowledge for Deburring Tasks
S. F. Su[1], T. J. Horng[2] and K. Y. Young[2]
[1]National Taiwan University of Science and [2]Technology and National Chiao Tung University

- To obtain optimal parameters (skill) through virtual training.

- Fuzzu rules are the skill knowledge to be found.

- Evolution Strategies are used to search for the best fuzzy rules.

- The results of deburring are more satisfactory than that of the previous work.

Self-Adaptive Neuro-Fuzzy Systems with Fast Parameter Learning for Autonomous Underwater Vehicle Control
J. S. Wang[1], C. S. G. Lee[1] and J. Yuh[2]
[1]Purdue University and [2]University of Hawaii

- A Generic Multi-Layer Neuro-Fuzzy Control Architecture

- Linear and Nonlinear Optimization for Fast Parameter Learning

- Neuro-Fuzzy Networks with Self-Adaptive and Self-Organizing Capabilities

- Computer Simulation Verification for Controlling an AUV