Learning and Evolution in Agent Based Systems

Papers from the 2004 AAMAS Workshop
July 20, 2004
New York, NY

Sandip Sen (chair)

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Foreword

Researchers in machine learning and adaptive systems have been addressing issues concerned with learning and adapting from past experience, observation, failures, etc. Whereas most of this research has focused on techniques for acquisition and effective use of problem solving knowledge from the viewpoint of a single autonomous agent, recent investigations have opened the possibility of application of some of these techniques in multiagent settings.

The goal of this workshop is to focus on research that will address unique requirements for agents learning and adapting to their environment. Recognizing the applicability and limitations of current machine learning research when applied to situated agents was deemed particularly relevant to this workshop. The call-for-paper also encouraged presentation and discussion of ideas relating to evolutionary learning and adaptation techniques in the context of agent based systems. Research contributions that address new learning modalities, e.g., the use of communication to enhance learning, and applications of learning in key multiagent problems like negotiation, teamwork, trust, auctions, supply chains, etc. were solicited.

We focus on three different ways in which machine learning can be used to enhance the performance of an Agent Based System:

1. An agent can learn the preferences and changing priorities of associated users.

2. An agent can learn about other agents in the environment in order to compete and/or cooperate with them. An agent can learn from other agents, taking advantage of their experiences and incorporating these into its own knowledge base.

3. An agent can learn about other regularities in its environment.

To encourage discussion and research on these issues, myself and some other researchers organized a workshop on "Adaptation and Learning in Multiagent Systems" in association with IJCAI-95 in Montreal, Canada. Since then a number of workshops and symposia have been held on the topic and several journal special issues have also been published. One of the most recent such workshop was the AGENTS-00/ECML-00 workshop on "Learning Agents." Myself and the members of the organizing committee, leading researchers with expertise in the workshop theme, believed that AAMAS-04 would be a preferred venue to host a workshop on the topic of learning agents to explore new possibilities and novel ideas in this area. In addition to the diverse set of papers to be presented in the workshop, we also plan to host an invited speaker. We look forward to an interesting workshop with informative discussions and constructive exchange of ideas.

I am thankful to the members of the organizing committee, the authors, the additional reviewers for the quality and sincerity of their efforts and service. I look forward to the participation of all the attendees to the workshop to make this event a fruitful and educational experience.

Sandip Sen
Workshop Chair

Workshop Schedule

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AAMAS-04 Workshop
on
Learning and Evolution in Agent Based Systems

July 20, 2004

Schedule of presentations
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9:00 Introductory Remarks

SESSION I

9:15-9:30 Myriam Abramson and Ranjeev Mittu
"Joint Intentions and Joint Actions: Closing the
Loop"
Xin Li, Qingping Tao, Leen-Kiat Soh
"Learning Negotiation Approach Selection with
SVM"
Eric Hsu
"Decomposition-Based Optimization Techniques for
Distributed
Agent-Based Systems"

9:30-10:30 Invited Speaker: TBA

10:30-11:00 COFFEE BREAK (30 minutes)

SESSION II

11:00-11:25 Vanessa Frias-Martinez and Elizabeth Sklar
"A team-based co-evolutionary approach to multi
agent learning"
11:25-11:50 Matthew E. Gaston, John Simmons, and Marie DesJardines
"Learning to Form Teams in Networks"
11:50-12:15 St?ephane Airiau, Nilanjan Ganguly, Sandip Sen,
Sabyasachi Saha
"Evolutionary tournament-based comparison of
learning and non-learning
strategies for iterated games,"

12:15-12:30 Discussions

12:30-2:00   LUNCH (90 minutes)

SESSION III

2:00-2:25   Jacob Crandall and Michael A. Goodrich
"Establishing Reputation Using Social Committment in Repeated Games"
2:25-2:50   Partha S. Dutta, Srinandan Dasmahapatra, Steve R. Gunn, Nicholas
R. Jennings, and Luc Moreau
"Strategic Communication to Improve Distributed Learning"
2:50-3:15   Teddy Candale & Sandip Sen
"Choosing satisficing service providers by learning referrals"

3:15-3:30   Discussions

3:30-4:00 COFFEE BREAK

SESSION IV

4:00-4:25   Avi Rosenfeld, Gal A Kaminka, and Sarit Kraus
"Adaptive Robot Coordination using Interference Metrics"
4:25-4:50   S?bastien Paquet, Nicolas Bernier and Brahim Chaib-draa
"Selective Perception Learning for Tasks Allocation"
4:50-5:15   Yoav Horman and Gal A. Kaminka
"Improving Sequence Learning for Modeling Other Agents"
5:15-5:30   Discussions

5:30 Closing remarks

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Table of Contents