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Agents for Educational Games and Simulations

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Revised Papers

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Preface

This book consists mainly of revised papers that were presented at the Agents for Educational Games and Simulations (AEGS) workshop held on May 2, 2011, as part of Autonomous Agents and MultiAgent Systems (AAMAS) conference in Taipei. This was the latest of a series of workshops that have been held at AAMAS conferences covering different aspects of how agents interact with humans in a variety of situations. Examples of these can be found in various human activities, such as in education, business transactions, military operations, medical care, and crisis management. Human-agent interaction is particularly important where training and support can be provided effectively using serious games and simulations. The role of agents to model and simulate naturally behaving characters becomes more and more important in these types of games and simulations. This is especially true where the games are not just meant to provide fun, but are used to support the learning process.

The workshop brought together various aspects of current work in this area. It was divided into four sessions:

- Middleware Applications
- Dialogues and Learning
- Adaption and Convergence
- Agent Applications

Three papers were presented in the first session, Middleware Applications. The first by Ranathunga et al. entitled “Interfacing a Cognitive Agent Platform with Second Life” describes how the authors developed a framework to facilitate agent-based interactions on the basis of the JASON BDI interpreter within the popular Second Life virtual world. In their paper “CIGA: A Middleware for Intelligent Agents in Virtual Environments,” Van Oijen et al. present CIGA, a middleware to facilitate this coupling by tackling the design issues in a structured approach, not only for embodied agent design but also for the system as a whole. In “How to Compare Usability of Techniques for the Specification of Virtual Agents’ Behavior? An Experimental Pilot Study with Human Subjects,” Gemrot et al., investigate the effectiveness of using a high-level AI system, POSH, to program behaviors against using Java. While their results were inconclusive, in that POSH outperforms Java in one task but not the other, they discuss the lessons learnt from the evaluation process and propose possible improvements to the experimental design.

The second session considered Dialogues and Learning and again consisted of three papers. In “Dialog Designs in Virtual Drama: Balancing Agency and Scripted Dialogs,” Kao and Von-Wun Soo present a speech-based dialogue generation framework to define the relationship between dialogues and story plots. In “Learning by Playing in Agent-Oriented Virtual Learning Environment,” Cai

and Shen propose an agent-oriented virtual learning environment to support a new learning by playing paradigm, in which each learning object is built up as a goal of a goal-oriented learning agent. In “Collection and Analysis of Multimodal Interaction in Direction Giving Dialogues: Toward an Automatic Gesture Selection Mechanism for Met-averse Avatars,” Tsukamoto et al. report an empirical study designed to build a spatial gesture mechanism in Metaverse avatars (the avatars used in Second Life).

In the third session, entitled Adaption and Convergence, Westra et al. discussed “Organizing Scalable Adaptation in Serious Games” and show that using agent organizations to coordinate the agents is scalable, allowing adaptation in very complex scenarios while ensuring that the storyline is preserved at the right difficulty level for the trainee. Chien and Soo investigated how dialogical interactions affect the mental states of individual agents, and the relations between them in “Inferring Pragmatics from Dialogue Contexts in Simulated Virtual Agent Games.” Alvarez-Napagao et al. propose an extension of their framework to support emergent narrative in games in “Socially Aware Emergent Narrative.” An additional paper by Wißner et al., “Increasing Learners’ Motivation Through Pedagogical Agents: The Cast of Virtual Characters in the DynaLearn ILE,” describes different character roles; how their knowledge is generated and related to the pedagogical purpose at hand; how they interact with the learners; and finally how this interaction helps increase the learners’ motivation.

The final session considered Agent Applications. Two papers were presented. Hadad and Rosenfeld in “ADAPT: Abstraction Hierarchies to Better Simulate Teamwork Under Dynamics” present a lightweight teamwork implementation by using abstraction hierarchies. The basis of this implementation is ADAPT, which supports **A**utonomous **D**ynamic **A**gent **P**lanning for **T**eamwork. ADAPT succinctly decomposes teamwork problems into two separate planners: a **task** network for the set of activities to be performed by a specific agent and a separate **group** network for addressing team organization factors. Finally Campano et al. in “An Architecture for Affective Behaviour Based on the Conservation of Resources” offer a model for autonomous virtual agents that enables them to adopt behaviors that can be perceived by human observers as emotional.

We would like to thank all the authors, the Program Committee and the referees, without whose help and hard work, we would not have been able to run a successful workshop.

May 2012

Frank Dignum
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