Preface

This book is based on a selection of papers presented at the International Workshop on the Educational Uses of Multi-Agent Systems (EduMAS) which was held in conjunction with the International Workshop on Agent Based Systems for Human Learning and Entertainment (ABSHLE) at the Eighth International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS) held in Budapest Hungary, in May 2009. This was the latest of a series of workshops dating from 2004 (EduMAS) and 2005 (ABSHLE), each of which has explored both the educational opportunities offered by Multi-Agent systems and educational uses of such systems to provide much more interactive and realistic educational and educational scenarios.

This structure is reflected in the two major structures of this book. The first section explores the educational opportunities both within the Computing subject area. The first two chapters explore the capabilities and uses of NetLogo. The third chapter investigates how creative design can be incorporated more effectively into Software Engineering courses, which all too often concentrate on the technological design issues, rather than creativity. The fourth chapter considers how the introduction of Multi-Agent concepts can be used to better explain the many complex concepts that are part of the study of Computing.

The second section considers how multi-agent systems can assist in teaching in other areas beyond computing. The first chapter in this section describes how the authors have used multi-agent systems to introduce students from a wide range of backgrounds to artificial intelligence principles and techniques and the second describes the selection and development of novel material to motivate students from a wide range of disciplines about the fundamental philosophical, ethical and social issues surrounding multi-agent systems.

The third section looks at some of the ways that the technology can be used to assist in presenting often complex educational, training and other material much more effectively. The first two chapters explore the use of agents and MAS as a means to assist learning. A number of tensions accompany the use of agents in these contexts, since the goal is not to simulate Autonomous Agents for their own sake, but to use them to create an interactive experience with a pre-defined goal for the human user: either to learn a curriculum or to experience an engaging and rich world (or both, in the case of “edutainment”). Unlike fully author-controlled experiences such as films and plays, or fully scripted computer-aided instructional systems, dynamic interactive experiences require a world that can appropriately and meaningfully respond to the user - a natural fit for intelligent and believable agents. At the same time, however, system designers want to shape users’ experiences, presenting new research challenges to address the interplay between player autonomy and designer intent. Thus, within this area of research, there is a design space that ranges from complete autonomy for agents to complete control for an agent coordinator.
The last section explores specific issues related to the development of educational and entertainment activities using Multi-Agent systems. The first explores some of the issues that need to be considered when developing educational materials using Multi-Agent technology, the second introduces the need to consider emotion into the Human-Agent interactions, the third presents a method by which such materials can be developed more rapidly and cost effectively, involving the domain experts in the design process. The fourth chapter introduces the advantages of personalisation and the final chapter recounts experiences in using recommender agents to assist students to understand the uses of agency for solving real world problems.

The range of topics covered is extensive, and introduces many of the issues that need to be addressed if the educational, training and entertainment capabilities of Multi-Agent systems are to be realised fully over the next few years. We hope that you find this book informative and that it helps you to understand the capabilities offered by introducing agents into your learning, teaching and educational environments.

Martin Beer
Sheffield Hallam University, UK

Maria Fasli
University of Essex, UK

Debbie Richards
Macquarie University, Australia