

**2006 IEEE Symposium on
Computational Intelligence and
Games**

CIG'06

May 22-24 2006

Reno/Lake Tahoe, USA

Sushil Louis and Graham Kendall (editors)

IEEE Catalog Number: **06EX1415**
ISBN: 1-4244-0464-9
Library of Congress: 2006926422

Copyright and Reprint Permission: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Operations Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. All rights reserved. Copyright ©2006 by the Institute of Electrical and Electronics Engineers

Contents

Preface	5
Acknowledgements	6
Program Committee	7
Plenary Presentations	
Looking Back at Deep Blue <i>Murray Campbell, Member of the Deep Blue Team, IBM TJ Watson Research Center.</i>	9
Challenges for Game AI <i>Ian Lane Davis, CEO of MAD DOC software</i>	9
Beyond Entertainment: AI Challenges for Serious Games <i>Michael Van Lent, Institute for Creative Technologies</i>	9
Oral Presentations	
ChessBrain II – A Hierarchical Infrastructure for Distributed Inhomogeneous Speed-Critical Computation <i>Colin M. Frayn, Carlos Justiniano and Kevin Lew</i>	13
Grid-Robot Drivers: an Evolutionary Multi-agent Virtual Robotics Task <i>Daniel Ashlock</i>	19
Optimizations of data structures, heuristics and algorithms for path-finding on maps <i>Tristan Cazenave</i>	27
Decentralized Decision Making in the Game of Tic-tac-toe <i>Edwin Soedarmadji</i>	34
Integration and Evaluation of Exploration-Based Learning in Games <i>Igor V. Karpov, Thomas D'Silva, Craig Varrichio, Kenneth O. Stanley, Risto Miikkulainen</i>	39
A Coevolutionary Model for The Virus Game <i>P.I.Cowling, M.H.Naveed and M.A. Hossain</i>	45
Temporal Difference Learning Versus Co-Evolution for Acquiring Othello Position Evaluation <i>Simon M. Lucas and Thomas P. Runarsson</i>	52
The Effect of Using Match History on the Evolution of RoboCup Soccer Team Strategies <i>Tomoharu Nakashima, Masahiro Takatani, Hisao Ishibuchi and Manabu Nii</i>	60
Training Bao Game-Playing Agents using Coevolutionary Particle <i>Johan Conradie and Andries P. Engelbrecht</i>	67
Towards the Co-Evolution of Influence Map Tree Based Strategy Game Players <i>Chris Miles and Sushil J. Louis</i>	75
A Player for Tactical Air Strike Games Using Evolutionary Computation <i>Aaron J. Rice, John R. McDonnell, Andy Spydell and Stewart Stremler</i>	83
Exploiting Sensor Symmetries in Example-based Training for Intelligent Agents <i>Bobby D. Bryant and Risto Miikkulainen</i>	90
Using Wearable Sensors for Real-Time Recognition Tasks in Games of Martial Arts – An Initial Experiment <i>Ernst A. Heinz, Kai S. Kunze, Matthias Gruber, David Bannach and Paul Lukowicz</i>	98
Self-Adapting Payoff Matrices in Repeated Interactions <i>Siang Y. Chong and Xin Yao</i>	103
Training Function Stacks to play the Iterated Prisoner's Dilemma <i>Daniel Ashlock</i>	111
Optimization Problem Solving using Predator/Prey Games and Cultural Algorithms <i>Robert G. Reynolds, Mostafa Ali and Raja' S. Alomari</i>	119

Capturing The Information Conveyed By Opponents' Betting Behavior in Poker <i>Eric Saund</i>	126
Modeling Children's Entertainment in the Playware Playground <i>Georgios N. Yannakakis, Henrik Hautop Lund and John Hallam</i>	134
NPCs and Chatterbots with Personality and Emotional Response <i>Dana Vrajitoru</i>	142
A Behavior-Based Architecture for Realistic Autonomous Ship Control <i>Adam Olenderski, Monica Nicolescu and Sushil J. Louis</i>	148
Modelling and Simulation of Combat ID - the INCIDER Model <i>Vincent A., Dean D., Hynd K., Mistry B. and Syms P.</i>	156
Evolving Adaptive Play for the Game of Spoof Using Genetic Programming <i>Mark Wittkamp and Luigi Barone</i>	164
A Comparison of Different Adaptive Learning Techniques for Opponent Modelling in the Game of Guess It <i>Anthony Di Pietro, Luigi Barone, and Lyndon While</i>	173
Improving Artificial Intelligence In a Motocross Game <i>Benoit Chaper and Colin Fyfe</i>	181
Monte-Carlo Go Reinforcement Learning Experiments <i>Bruno Bouzy and Guillaume Chaslot</i>	187
Poster Presentations	
Optimal Strategies of the Iterated Prisoner's Dilemma Problem for Multiple Conflicting Objectives <i>Shashi Mittal and Kalyanmoy Deb</i>	197
Trappy Minimax - using Iterative Deepening to Identify and Set Traps in Two-Player Games <i>V. Scott Gordon and Ahmed Reda</i>	205
Evaluating Individual Player Strategies in a Collaborative Incomplete-Information Agent- Based Game Playing Environment <i>Andrés Gómez de Silva Garza</i>	211
Highly Volatile Game Tree Search in Chain Reaction <i>Dafyd Jenkins and Colin Frayn</i>	217
Towards Generation of Complex Game Worlds <i>Telmo L. T. Menezes, Tiago R. Baptista, and Ernesto J. F. Costa</i>	224
The Blondie25 Chess Program Competes Against Fritz 8.0 and a Human Chess Master <i>David B. Fogel, Timothy J. Hays, Sarah L. Hahn and James Quon</i>	230
Anomaly Detection in Magnetic Motion Capture using a 2-Layer SOM network <i>Iain Miller, Stephen McGlinchey and Benoit Chaperot</i>	236
Intelligent Battle Gaming Pragmatics with Belief Network Trees <i>Carl G. Looney</i>	243
Fun in Slots <i>Kevin Burns</i>	249
Style in Poker <i>Kevin Burns</i>	257
Voronoi game on graphs and its complexity <i>Sachio Teramoto, Erik D. Demaine and Ryuhei Uehara</i>	265
Evolving Warriors for the Nano Core <i>Ernesto Sanchez, Massimiliano Schillaci and Giovanni Squillero</i>	272
Author Index	280