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IEEE Transactions on Games: Special Issue on Team AI in Games

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Recent years were marked with significant achievements of game Artificial Intelligence (AI) systems. Computer-controlled players excel in a wide range of environments, from traditional board games like chess and Go to fast arcade environments like Super Mario Bros. and one-vs-one fighting. One of the topical issues of today's research efforts aims at intelligent *team behavior*, relevant for a wide variety of games, including real-time strategy games, team sports, multiplayer online battle arena, and even tabletop games like Hanabi. The notion of team behavior is very rich, ranging from the ability to exhibit a clear and consistent strategy of an AI-controlled team to the capability of "melting into" a group of human-controlled teammates and supporting their coordinated actions. Consequently, design goals of an AI system can be driven by a variety of considerations, including efficiency, creativity, believability, synergism and contribution of the AI to the overall entertainment value of the game. There is also an imminent connection to artificial general intelligence (AGI) because distributed AIs have to be quite adaptive to new situations, including being confronted with other AIs that switch their behavior.

The purpose of this special issue of IEEE Transactions of Games is to further explore these and related topics, both presenting the current state of the art in team game AI systems, and offering a prime venue for publishing new research results in this field.

Primary topics of interest include:

- Development of efficient team strategies in various game genres.
- Genre-specific AI design problems.
- Approaches to team AI benchmarking.
- Learning by observation methods for team AI development.
- Evaluation principles of team behavior algorithms.
- Emergent team behavior.
- Design goals of team AI.
- Believability and entertainment value of AI-controlled teams.
- Teams of AI agents as opponents and teammates.

Authors should follow conventional Transactions on Games guidelines for their submissions, but clearly identify that their papers are aimed for this special issue. Three paper types will be considered for publication: *letters* (up to 4 pages), *full papers* (up to 10 pages), and *survey papers* (up to 15 pages). More information is available at the journal homepage: <http://transactions.games/>

Proposing Editors

Maxim Mozgovoy is an associate professor at the University of Aizu, Japan. He received his PhD degree in Applied Mathematics from St. Petersburg State University, and his PhD in Computer Science from University of Joensuu. His main research interests are focused on natural language processing and artificial intelligence for computer games. His current primary goal is to apply machine learning technologies to the task of practical game AI creation. Maxim has a solid academic record of over 50 published articles and industrial-level software development experience. In particular, he is the primary developer of a machine learning-based AI of the mobile tennis game *World of Tennis: Roaring '20s*.

Mike Preuss is an assistant professor at LIACS, the computer science institute of Universiteit Leiden in the Netherlands. Previously, he was with ERCIS (the information systems institute of WWU Muenster, Germany), and before with the Chair of Algorithm Engineering at TU Dortmund, Germany, where he received his PhD in 2013. His main research interests rest on the field of evolutionary algorithms for real-valued problems, namely on multimodal and multi-objective optimization, and on computational intelligence and machine learning methods for computer games, especially in procedural content generation (PGC) and real-time strategy games (RTS).

Tomoharu Nakashima is a professor in the Graduate School of Humanities and Sustainable System Science at Osaka Prefecture University, Japan, where he obtained a PhD in Engineering (2000). He obtained an MSc and BSc in the Department of Industrial Engineering at Osaka Prefecture University in 1997 and 1995, respectively. His research areas include hybrid systems of machine learning and computational intelligence such as constructing fuzzy rule-based systems from numerical data, meta-heuristic optimization of fuzzy rule-based systems. He has participated in RoboCup soccer simulation 2D league since 2001, he has won the world championship three times as well as being a runner-up five times.

Rafael Bidarra is associate professor Game Technology at the Faculty of Electrical Engineering, Mathematics and Computer Science of Delft University of Technology, The Netherlands. He graduated in electronics engineering at the University of Coimbra, Portugal, in 1987, and received his PhD in computer science from Delft University of Technology, in 1999. He leads the game technology research lab at the Computer Graphics and Visualization Group. His current research interests include: procedural and semantic modeling techniques for the specification and generation of both virtual worlds and gameplay; serious gaming; game adaptivity and game data analytics. Rafael has numerous publications in international journals and conference proceedings, integrates the editorial board of several journals, and has served in many conference program committees.