IEEE Transactions on Games (ToG)
Special Issue on Game Competition Frameworks for Research and Education

Special Issue Editors: Jialin Liu (Queen Mary University of London), Diego Pérez-Liébana (University of Essex), Tristan Cazenave (Université Paris-Dauphine), Ruck Thawonmas (Ritsumeikan University)

Rationale

Games are an ideal domain to study computational intelligence methods because they provide reproducible environments suitable for testing new search algorithms, pattern-based evaluation methods, or machine learning concepts. They are also good testbeds in education as they are fun to play for testing ideas and very attractive to students. Diverse game competitions have been designed for different research purposes, and some of them have been successfully organised for more than 10 years -- such as the game Go competition series and PacMan competition series -- and have attracted participants from both research and industry. Dozens of universities have used different game competition frameworks in modules of game design, artificial intelligence or machine learning. We expect this Special Issue will motivate the competition organisers to release the source code and provide more details about the framework, motivate further research and education using the existing game competition frameworks, as well as collect work in the areas such as planning, machine learning, optimisation and AI-assisted game design. In the call, we invite the submission of papers about high quality work on game competition frameworks, entry submissions, their use as research testbeds to obtain novel experimental results, or as educational and teaching material.

Related Special Issues

To the best of our knowledge, this will be the first Special Issue on game competition frameworks. In particular, after the renaming of the transactions, including the education use of game competitions frameworks will fit the extended scope of TOG.

Expected Submissions

We expect more than 20 papers will be submitted to this Special Issue.

Prospective Authors

The organisers and related research teams of the game competitions including those listed in the Call for Papers, such as Game Innovation Lab of NYU (USA), Sejong University (Korea), Computer Games and Artificial Intelligence team of UoE (UK), Game team of QMUL (UK). The participants of such competitions, in particular the winners and runner-ups, such as YOKOZUNA data (Japan) and Otto von Guericke University of Magdeburg (Germany). All who have used the game competition frameworks for their research or teaching, regardless of their participation to any competitions. Examples are the University of Muenster (Germany), TU Darmstadt (Germany), Universidad Carlos III (Spain), and the other institutions mentioned above. Notice that the game competition frameworks are not limited to those in the list provided in the Call for Papers.
Call for Papers

Submission Deadline: 8 January 2018                         Notification of Acceptance: 1 April 2018
Final copy due: 31 July 2018

Games are an ideal domain to study computational intelligence methods because they provide affordable, competitive, dynamic, reproducible environments suitable for testing new search algorithms, pattern-based evaluation methods, or machine learning concepts. Diverse game competitions have been designed for different research purposes and some of them have been successfully organised for 10 years, such as the game Go competition series and PacMan competition series. The past game competitions organised in conferences, industry or as private leagues have covered various games, from single-player board/video games to real-time strategy games. In different competitions, the participants are invited to submit an agent to play a specific game or a set of unknown games without intervention of human at least as good as professional human players, or to submit an agent to design a game or game rules. These have not only received submissions from academic institutions, but also attracted the attention of the games industry. Dozens of universities have used different game competition frameworks in modules of Game Design, Artificial Intelligence or Machine Learning.

The following is a list of suggested, not exclusive, competitions for this special issue:
- Angry Birds Level Generation
- Computer Game Olympiads (including Chess, Amazons, Backgammon, Bridge, Chinese Chess, Dots and Boxes, Draughts, Go, LOA, Shogi, ...)
- Dota2 Bot
- Fighting Game AI
- Game Data Mining
- General Video Game AI
- Geometry Friends Cooperative Game AI
- microRTS AI
- Ms. Pac-Man Vs Ghost Team
- Showdown AI
- StarCraft AI
- Text-Based Adventure AI
- Visual Doom AI

We invite the submission of papers about high quality work on game competition frameworks, entry submissions, their use as research testbeds to obtain novel experimental results, or as educational and teaching material. Regular, short and letter papers are invited to this special issue, with the following suggestion for these lengths:
- Letter papers detailing use of competitions as educational or teaching material OR describing competition entries;
- Short papers with a technical description of the game competition framework (including link to the released code of the benchmark) OR a description of competition entries;
- Regular papers describing work using a competition benchmark as a research environment for novel experimental results, OR description of the game competition including analysis of the top entries and final results.

Competition organisers and participants are encouraged to communicate and collaborate with each other to avoid duplicating descriptions of framework, rules, entries, etc. For more information, see the special issue webpage.

Authors should follow normal TOG guidelines for their submissions, but clearly identify their papers for this special issue during the submission process. Extended versions of previously published conference or workshop papers are welcome, provided that the journal paper is a significant extension, and is accompanied by a cover letter explaining the additional contribution. See here for author information and page length limit.
About the guest editors

Jialin Liu is currently a Postdoctoral Research Associate at Queen Mary University of London (UK). She holds a B.Sc. from the Huazhong University of Science and Technology (2010, China), an M.Sc. from the Université Paris-Sud and École Polytechnique (2013, France) and a Ph.D from the Université Paris-Saclay (2016, France). Her research interests include reinforcement learning, black-box noisy optimisation, portfolio algorithms and artificial intelligence in games. She has published more than 20 international conference papers and 4 journal papers in the aforementioned fields, and will be the Program Co-Chair of the IEEE’s 2018 Computational Intelligence on Games, one of the key conferences in the area of game artificial intelligence (http://www.liujialin.tech).

Diego Perez-Liebana is a Lecturer in Computer Games and Artificial Intelligence at the University of Essex (UK), where he achieved a PhD in Computer Science (2015). He holds an MSc and BSc degrees in Computer Science from University Carlos III (Madrid, Spain; 2007). He has published in the domain of Game AI, with interests on Reinforcement Learning and Evolutionary Computation. He organized several Game AI competitions, such as the Physical Traveling Salesman Problem and the General Video Game AI competitions, held in IEEE conferences. He has published more than 45 papers in the field of Game AI, including the main conferences and journals in the field of Computational Intelligence in Games. He has programming experience in the videogames industry with titles published for game consoles and PC (http://www.diego-perez.net/).

Tristan Cazenave is a Professor of artificial intelligence at LAMSADE Universite Paris-Dauphine. Author of more than a hundred scientific papers about artificial intelligence in games. He started to publish commercial video games when he was aged 16 and co-founded a successful web agency in 1992. He was the Editor in chief of the ICGA Journal (http://www.lamsade.dauphine.fr/~cazenave/).

About the associate editor

Ruck Thawonmas is a Professor in College of Information Science and Engineering at Ritsumeikan University (Japan), where he is leading the Intelligent Computer Entertainment Laboratory with more than 65 Lab's graduate-level alumni, around half of which are working in game industry. He has published more than 175 peer-reviewed papers in both Japanese and English; Two papers were cited more than 150 times each (Google Scholar); h-index = 21 (Google Scholar). In addition, his students won a number of prestigious game AI competitions such as the first AIBIRDS Level Generation Champion at the IEEE Conference on Computational Intelligence and Games (IEEE-CIG) 2016, the IEEE-CIG 2014 StarCraft AI Competition, and the AIIDE 2014 StarCraft AI Competition. He is currently an Associate Editor for IEEE Transactions on Computational Intelligence and AI in Games (04/2014—present) as well as Games for Health Journal (07/2014—present) (http://www.ice.ci.ritsumei.ac.jp/~ruck/).