

CALL FOR PAPERS

IEEE Transactions on Games Special Issue on Evolutionary Computation for Games

Editors:

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Evolutionary Computation (EC) techniques are regularly used as game/agent parameter tuning methods, policy optimizers for learning models, and search-based methods for Procedural Content Generation (PCG). In recent years, evolution has been combined with deep learning methods for training agents and generating game levels. However, several open questions remain, such as how to best reduce computational expense, what evolved representations are most suitable for different problems, how to exploit the advances in deep learning when combined with evolution, and what fitness functions to use when generating content that is normally judged in a subjective fashion by humans.

We expect this Special Issue to expand the scope of ToG and encourage more work on applying EC approaches to various aspects of games, including agent behavior, content generation, bug testing, and more. We welcome papers relevant to any applications of Evolutionary Computation for Games. Examples include, but are not limited to:

- Game, puzzle and agent design;
- Evolving agents, rules, levels, etc.;
- Assets including artwork, music, narrative, etc.;
- Game testing, automated repair and optimisation;
- Automated parameter tuning for games and agents;
- Dynamic difficulty and playability adjustment;
- EC with deep/reinforcement learning for games;
- Latent vector evolution for games;
- Co-evolution methods for games.

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About The Editors

Jacob Schrum (<https://southwestern.edu/~schrum2/>) is an Associate Professor of Computer Science at Southwestern University in Georgetown, Texas (USA), which is also where he received his B.S. degree in Computer Science, Math, and German. Jacob holds a Ph.D. and M.S. in Computer Science from the University of Texas at Austin (USA). Jacob’s research focuses on learning intelligent agent behavior and generating content for video games, particularly using neuroevolution and deep learning. In 2012 he won the BotPrize competition, which was a Turing Test for game bots. In 2018 he won first place in the Ms. Pac-Man track of the partially observable Ms. Pac-Man Vs. Ghost Team Competition. Jacob also regularly serves on the program committee for the Digital Entertainment Technologies and Arts track at GECCO, and is a member of the IEEE Games Technical Committee.

Anikó Ekárt (<https://research.aston.ac.uk/en/persons/aniko-ekart>) is a Reader in Computer Science at Aston University, UK, where she is Director of Research Degree Programmes in the College of Engineering and Physical Sciences. She has previously lectured at University of Birmingham, UK. She holds a PhD in Informatics from Eötvös Loránd University, Budapest Hungary. Her research interests include Artificial Intelligence, Machine Learning, Genetic Programming, and Evolutionary Art. She regularly serves on the programme committee of numerous scientific conferences and takes on active roles in organising them, including co-chairing EuroGP in 2010, the Genetic Programming track at GECCO in 2012 and 2013, Digital Entertainment Technologies and Arts track at GECCO in 2018 and 2019, EvoMUSART in 2019 and 2020. She is editing the “Evolution, the new AI Revolution” special issue of the SN Computer Science journal.

Cameron Browne (<http://cambolbro.com/>) is an Associate Professor at Maastricht University’s Department of Data Science and Knowledge Engineering (DKE), where he is running the €2m European Research Council (ERC) funded Digital Ludeme Project over the next five years. Cameron received his Ph.D. from the Queensland University of Technology (QUT) in 2009, winning a Dean’s Award for Outstanding Thesis and producing the world’s first published computer-generated games. He is the author of the books *Hex Strategy*, *Connection Games* and *Evolutionary Game Design*, which won the 2012 GECCO “Humies” award for human-competitive results in evolutionary computation. He is a Section Editor of the *IEEE Transactions on Games* and the *International Computer Games Association (ICGA) Journal*, and is the founder and Editor-in-Chief of the *Game & Puzzle Design journal*. Cameron is the designer and technical lead of the Ludii general game system (<http://ludii.games>).

Jialin Liu (<http://www.liujialin.tech>) is currently a Research Assistant Professor at the Department of Computer Science and Engineering of Southern University of Science and Technology (SUSTech, China). Before joining SUSTech, she was a Post-doctoral Research Associate at Queen Mary University of London (QMUL, UK). Jialin holds a Ph.D. Degree in Computer Science from the Inria Saclay and the Université Paris-Saclay (France). Her research interests include AI and games, noisy optimisation, portfolio of algorithms and meta-heuristics. Jialin serves as Program Co-Chair of IEEE CIG2018, Competition Chair of several international conferences. She also serves as an Associate Editor for the IEEE Transactions on Games. Jialin is chairing the IEEE CIS Games Technical Committee.