

Call for Papers

Games and AI. Special Issue

(Edited by Mathias Fuchs and Andreas Sudmann)

Long before *AlphaGo* and *Deep Blue* successfully challenged Go and Chess champions, computer scientists used games to develop and test methods and systems of artificial intelligence (AI). Games thus became benchmark environments for the performance and capabilities of AI systems. Many digital games might be understood as technically implemented epistemic devices that seem to act and react in an almost intelligent manner. When dealing with characters in games we behave as if we would encounter human intelligence, even when we are aware that our ludic opponents are just machinic entities and that their behavior is code-driven. Does this mean that AI has always been a project of dispersed intelligence between machines and humans (or, if one prefers to use ANT terminology, between human and non-human actors)? In this respect a clarification of the terminology seems to be useful. When do we and when should we talk about »AI«, »Classical AI«, »Artificial General Intelligence«/AGI (Goertzel/Pennachin 2007), or about »Computational Intelligence« (cf. 9th Computer Science and Electronic Engineering Conference, Computational Intelligence and Games)?

In his famous 1950 article in the journal *Mind*, Alan Turing pointed out how games play an important role in the development of intelligent machines. Seven years later, Herbert Simon predicted four major developments of AI that were to be accomplished during the following decade: Amongst mathematical problem solving and computerized composition he announced that a chess playing program will defeat the world champion (Newell & Simon 1961). Also in the 1950s, AI pioneer Arthur Samuel implemented a machine learning algorithm for the game checkers (Samuel 1959, Sudmann 2017).

Today we observe how games lead the way to advanced forms of AI: Already before the spectacular successes of *AlphaGo* (and very recently *AlphaGo Zero*), the famous AI company DeepMind was able to establish a system mastering classic Atari 2600 games like or even better than human experts.

With regard to today's proclaimed AI revolution, the hardware development of advanced GPU processors, as used in gaming gear, is not only supportive but rather mandatory for the performance of complex AI tasks (Sudmann 2016, 2017). Furthermore, clusters of gaming consoles have been used to perform tasks that formerly could only be run on supercomputers (Escribano in: Zackariasson 2012).

Last but not least, artificial neural network (ANN) technologies are amongst other approaches favoured by the games industry to make bots look and react more appropriately or to, at least, create the impression of intelligent behaviour. Procedurally generated environments based on AI algorithms modify our perception of how artificial worlds could look like and shift the border of distinctions between man-made 3D environments and machine-built levels.

In light of the above, the next issue of *Eludamos* invites contributions that interrogate the multifarious connections and interrelations between computer games and AI.

Contributions can focus on but are not limited to the following subjects and research perspectives:

- Games and Rule-Based AI
- Games and Artificial Neural Networks
- Games and Reinforcement Learning
- Spatial Aspects of AI in Games
- Temporal Aspects of AI in Games
- Games as Benchmark Tests for AI Systems
- Games and AI from a Media Archaeological Perspective
- Games and AI as a Form of Dispersed Intelligence Between Human and Non-Human Actors
- Toy Robots and AI
- Gamification and AI
- Games, AI, and Capitalism

Submission Guidelines:

Interested authors are asked to submit an abstract (500 words) until December 1, 2018. The editors will review all abstract submissions within two weeks after this deadline. Full papers are expected to be submitted until March 1, 2019.

Please send your abstracts to both of the following e-mail accounts:

mathias.fuchs@leuphana.de

andreas.sudmann@rub.de

Looking forward to your contributions!