

Analysis and Simulation of Actions in Games by Means of Special Self-Organizing Maps

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Abstract

Meanwhile, not a lack of data is the bottle neck of computer based game analysis but – quite the contrary – the huge amount of them: Data can be recorded automatically in high space and time resolution, resulting in a high percentage of irrelevant data hiding the real information. Trainers are experienced in filtering the most meaningful patterns out of those lots of data but then often miss methods or tools for further systematic analyses. The Neural Network-approach follows the trainers' way of pattern recognition, combining it with computer based methods of complex pattern analysis. The contribution demonstrates exemplarily how it works: In a pre-processing the players' positions are grouped to constellations, e.g. representing offence and defence groups. After the net training, the neurons of the net correspond to typical constellation, and trajectories of the neurons represent time-depending processes of the game. The trajectories themselves are then taken as objects of a second level net based analysis, where, by semantic calibration, types of trajectories are mapped to tactical activities – e.g. short or long attacks on the right or the left side. Finally, as an outlook, the second level network not only represents the given tactical dynamics of the game but can be taken for simulating new ones: Instead of just watching, which neuron is activated by a current tactical activity, an alternate neuron can be selected and fed into a game simulator to see what happens if tactics is changed temporarily.

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