



Fuzzy Logic and Computer Games

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Computer game industry is one of the biggest high-tech industry as well as its revenue. Depending on their virtual worlds which inspire from real-world dynamicity or facts, they are a perfect test-bed for computational intelligence methods or several types of research [1]-[3]. In the area of computational intelligence, Ordinary (Type-1) fuzzy logic has made a significant breakthrough, especially Type-2 (T2) Fuzzy Logic that is a generalization of Type-1 (T1) fuzzy logic. T2 Fuzzy Logic Controllers (FLCs) have been successfully employed in various engineering problems since IT2-FLCs have the capability of handling high-level uncertainties as well as nonlinear dynamics in comparison with its T1 and conventional counterparts [4], [5].

I will handle three popular computers, namely Flappy Bird Lunar Lander, The Open Racing Car Simulator (TORCS). The games inherent high level of uncertainties and randomness which are the main challenges of the games for a human player. Thus, they can be seen as challenging testbeds for benchmarking fuzzy logic control systems as they provide dynamic and competitive elements that are similar to real-world control engineering problems. As the game player can be considered as the main controller in a feedback loop, we will construct intelligent control systems that are capable to imitate the game player by using T1 and T2 FLCs.

The results of the paper will show that a fuzzy structure is capable to handle the uncertainties caused by the nature of the games by presenting both simulations and real-time game results.

Keywords: Fuzzy Logic, Type-2 Fuzzy Logic, Lunar Lander, Flappy Bird, TORCs

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