

Robot Pursuit with Co-Evolution

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Abstract

This talk is about robot pursuit with co-evolution. First the cooperation of predating robots (predators) to pursue escaping robot (prey) is formulated as a dynamic optimization problem, which is suitable for swarm intelligence algorithms to solve. Since each predator can only be at one place at any instance, which makes the commonly used Pittsburgh-type individual representation not suitable or at least not convenient to use, therefore, the Michigan-type individual representation together with its weakness will be introduced in the second part. Due to the intrinsic characteristic of the cooperation among the predators, the co-evolution will be then introduced. Final, a co-evolutionary particle swarm optimization algorithm, which is a combination of modified Michigan-type individual representation and co-evolution and is specifically designed to solve the dynamic optimization problem formulated for the robot pursuit problem, will be described in detail and validated with experimental results.



Yuhui Shi is a Chair Professor in the Department of Computer Science and Engineering, Southern University of Science and Technology (SUSTech), Shenzhen, China. Before joining SUSTech, he was with the Department of Electrical and Electronic Engineering at the Xi'an Jiaotong-Liverpool University (XJTLU), Suzhou, China, from January 2008 to August 2016, and was with the Electronic Data Systems Corporation (EDS), Indiana, USA, from October 1998 to December 2007. He is an IEEE Fellow, and the Editor-in-Chief of the International Journal of Swarm Intelligence Research. Dr. Shi co-authored a book on Swarm Intelligence

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