

Jordan University of Science and Technology

A New Fine-Grained Multithreaded Game Engine Approach

Authors: Hassan Najadat, Yasser M. Jaffal, Basel A. Mahafzah, Safwan S. Al-Omar

Abstract: Fine-grained multithreaded applications are becoming more vital as new processing hardware is moving towards larger number of processing cores per CPU. The increased number of cores facilitate performance enhancement of real-time applications including computer games. In this paper, we present a new design for a multithreaded game engine which incorporates multithreading each game engine component separately using data decomposition. Our approach suggests maintaining sequential game loop to avoid major changes on current single-threaded game engines. Experimental results have shown a maximum relative speedup of 3.36 and a maximum relative efficiency of 84%, which are achieved on 4-core CPU, in addition to component-level enhancements, which reflects high utilization of the multi-core platform