

2D and 3D COMPUTER GRAPHICS ALGORITHMS UNDER MORPHOSYS

Issam Damaj, Suhaib Majzoub and Hassan Diab

issamwd@ieee.org; s_majzoub@hotmail.com; diab@aub.edu.lb

Department of Electrical and Computer Eng'g
Faculty of Engineering and Architecture
American University of Beirut
P.O. Box 110236
Beirut, Lebanon

Abstract. *This paper presents new mappings of 2D and 3D geometrical transformation on the MorphoSys (M1) reconfigurable computing (RC) prototype [2]. This improves the system performance as a graphics accelerator [1-6]. Reconfigurable computing is introduced, followed by the MorphoSys (M1) RC system and Celoxica RC-1000 FPGA. Moreover, three algorithms are mapped. These algorithms include two different approaches for calculating 2D transformations, and one algorithm is for 3D transformations fast computations. The results presented indicate an improved performance. The speedup achieved is explained as well as the advantages in the mapping of the application. The transformations on an 8x8 RC array were run, and numerical examples were simulated to validate our results, using the MorphoSys mULATE program, which simulates MorphoSys operations. Comparisons with other systems are presented, namely, with Intel processing systems and Celoxica RC-1000 FPGA.*