

Image Warping Using a Novel Recursive Transformation Algorithm

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Abstract

Image warping is frequently used to correct the distortion caused by image translation, rotation, skewing or scaling. Since image warping involves a tremendous amount of arithmetic operations, huge computational efforts are required. This paper presents a novel recursive transformation algorithm for the second order image warping. The proposed algorithm can be employed to compute pixel coordinates efficiently by reducing the computational complexity significantly for high-speed image warping applications. The transformation algorithm is implemented by software on a computer for performance evaluation. The result of which shows a tenfold improvement in execution speed compared with that of the conventional image warping method. Using the proposed algorithm, a high-throughput image warping with efficient computational capability can be realized.

1. INTRODUCTION

Digital image systems inherently have geometric distortions. Warping, a capability of geometric or spatial transformation found in many image processing systems, is utilized to correct the distortions in order to present the image with high fidelity. In addition, warping makes image registrations with different viewing angle and scaling possible. The desire to perform image warping arises from basic analysis tasks such as obtaining a better perspective of information in the image,