

图形、图像、模式识别

基于视频纹理的自然场景建模方法

李 骋, 钱文华, 徐 丹

云南大学 计算机科学与工程系, 昆明 650091

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摘要 提出了一种改进的基于视频纹理合成的自然场景建模方法。算法通过衡量图像之间的相似度来确定一个视频的初步播放序列, 然后将这个初步播放序列划分成几个子序列并调整视频播放过程中的帧与帧之间的延迟, 从而消除视频播放中的跳变。为了消除视频循环播放中最后一帧到第一帧的跳变, 首先确定初步的播放序列的周期, 然后根据周期选取用于合成最终播放序列的图像并对选取的图像根据周期的长短选择以单帧图像或子序列为单位进行图像剖分, 最后把剖分后的图像重新组合成最终的播放序列。算法对于各种有周期性或近似于有周期性运动的自然场景都能合成贴近真实的视频效果。

关键词 [视频纹理](#) [纹理合成](#) [周期](#) [初步播放序列](#) [最终播放序列](#) [子序列](#)

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Algorithm for natural phenomena simulation based on video texture

LI Cheng, QIAN Wen-hua, XU Dan

Department of Computer Science and Engineering, Yunnan University, Kunming 650091, China

Abstract

This paper proposes an improved video-based texture synthesis approach for simulating realistic natural phenomena. The algorithm measures similarity of every two frames to determine an initial playing sequence and then divides the initial playing sequence into several subsequences with different frame-to-frame delay, so as to remove visual discontinuities. For removing the abrupt change from the last frame to the first frame in the video loop, at first the algorithm determines the cycle of the initial playing sequence. Then the algorithm chooses several frames from the initial playing sequence based on the cycle and divides every single chosen frame or subsequences into patches, which depends on the cycle of video. At last the algorithm re-organizes these patches into a final playing sequence. The experiment results indicate that the algorithm is easy to synthesizing realistic effects of natural surrounding video which has repetitive or quasi-repetitive motions.

Key words [video texture](#) [texture synthesis](#) [cycle](#) [initial playing sequence](#) [final playing sequence](#) [subsequence](#)

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通讯作者 李 骋 licheng19841984@yahoo.com.cn

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