

研究报告

虚拟森林景观中林火蔓延模型及三维可视化表达

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摘要

传统上的林火模拟通常只选用一种林火模型,用一个简单的椭圆预测林火蔓延时火场各个位置的情况,与现实中火灾蔓延状况相差甚远,而且以往的林火蔓延是基于二维可视化表达,表达信息有限.本系统采用现今运用最广泛的Rothermel模型,利用Huygen原理,并以改进的粒子系统方法三维模拟在不同的风速、坡度下林火在火场不同位置的扩散行为.采用该方法模拟林火扩散行为,不仅能实时显示受灾面积、火势蔓延的方向、火势大小,且能给人以真实感.并将该方法成功地应用于福建漳浦林区.

关键词 [虚拟森林景观; 林火蔓延; 林火模型; 粒子系统; 三维可视化](#)

分类号

Forest fire spread modeling and 3D visualization in virtual forest landscape

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Abstract

The traditional method for simulating the behaviors of forest fire is to use a single ellipse to represent all of the fire points in fire scene, which has many disadvantages, e.g., the simulated result is quite different to the real situation, and it is mainly based on 2D. As a result, the represented information is limited. In this paper, the most widely used Rothermel fire spreading model and the principal of Huygen were adopted to simulate the behaviors of forest fire in different position and wind direction, and the results were shown by pseudo-particle system in 3D, which could not only get the area of fire suffering, the direction of fire spreading and the size of fire, but also provide realistic simulation to observers. The method has been successfully applied to Zhangpu forest in Fujian Province.

Key words

[Virtual forest landscape](#) [Forest fire spreading](#) [Forest fire](#)

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