

為網路虛擬實境產生自動導覽路徑 Generating Customizable Guided Tours For Networked Virtual Environments

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Outline

- Introduction
- Related Work
- Problem Description and Simplifications
- System Design
- Implementation
- Experimental Results
- Conclusion

Introduction

- User Interface
 - ◆ 2D display 3D display(VR)
- User Habit
 - ◆ 2D mouse vs. 3D environment
- Smart system
 - ◆ automatically generate a customizable tour path for user

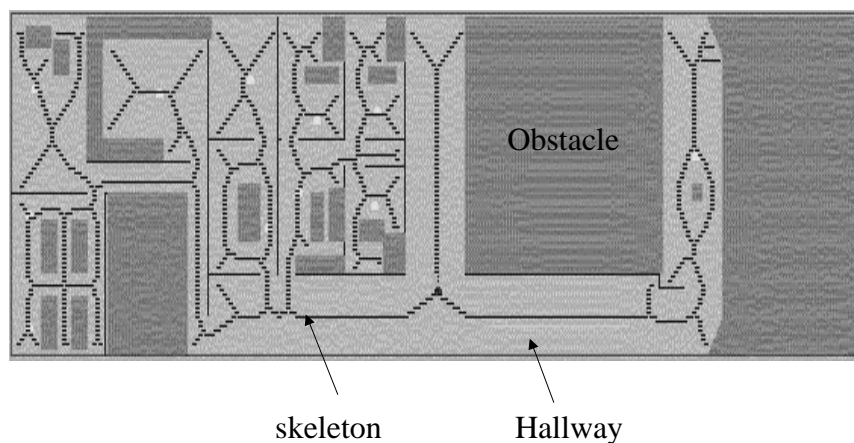
Related Work

- Guided Tours and VRML
 - ◆ 1.0 static object
 - ◆ 2.0 dynamic features
- Motion Planning
 - ◆ generate a navigation plan for a robot (moving object) in a known environment

Problem Description and Simplifications

- The Planning Problem
 - ◆ generate collision-free path
 - ◆ find an optimal sequence for traversing the given locations
- Simplifications
 - ◆ simplify geometric model of the moving object
 - ◆ define the distance between two locations
 - ◆ fixed environment

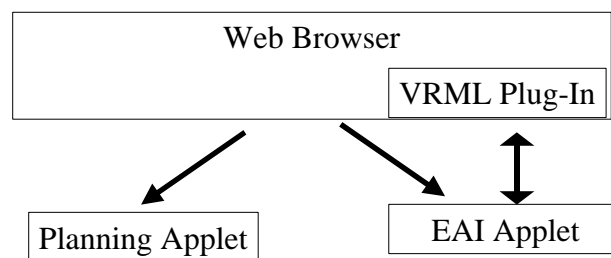
An example of skeleton for a freespace



System Design

- 3D-display Module
- Planning Module
- Integration Module

System Structure

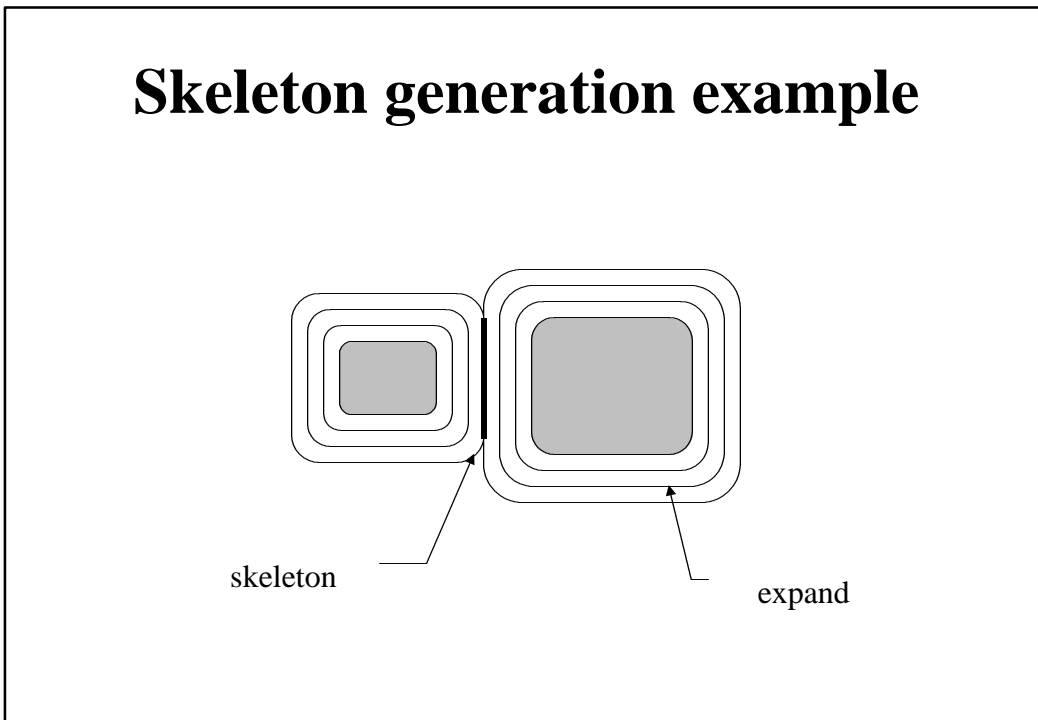
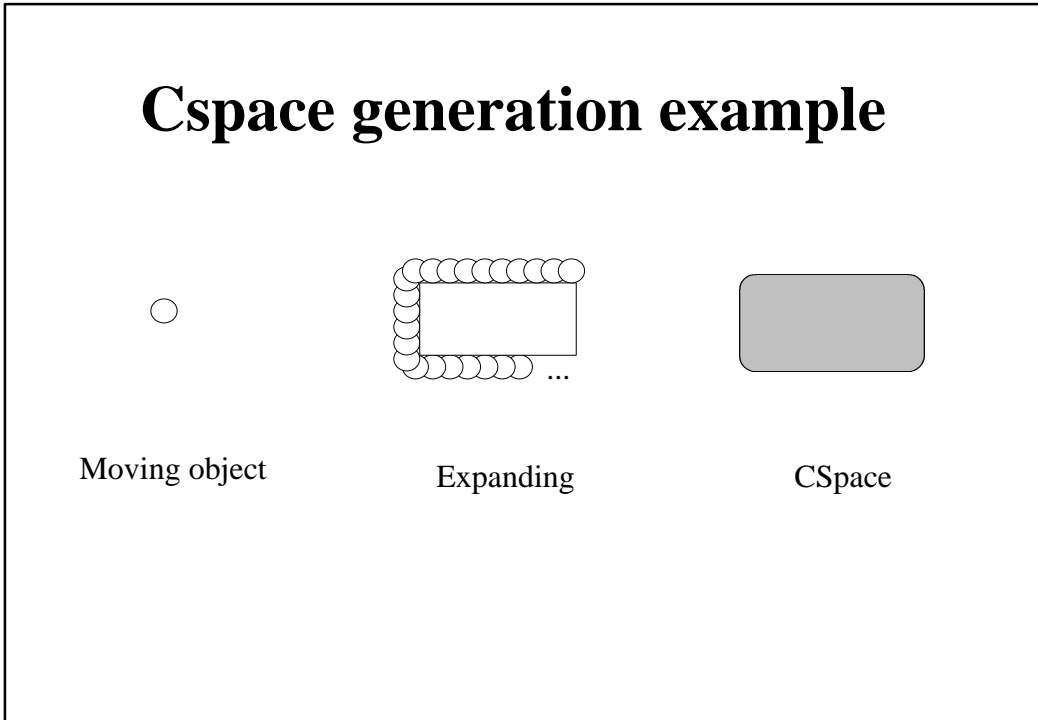


System Design (1)

- 3D-display Module
 - ◆ **a large model** **several small models:**
 - ≈ for performance
 - ◆ **proximity sensors:**
 - ≈ for automatic adjacent scenes transitions
 - ◆ **external program:**
 - ≈ for adding more sophisticated programming logic

System Design (2)

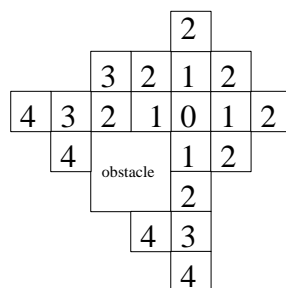
- Planning Module
 - ◆ skeleton
 - ◆ visiting sequence
 - ◆ smooth
- Integration Module



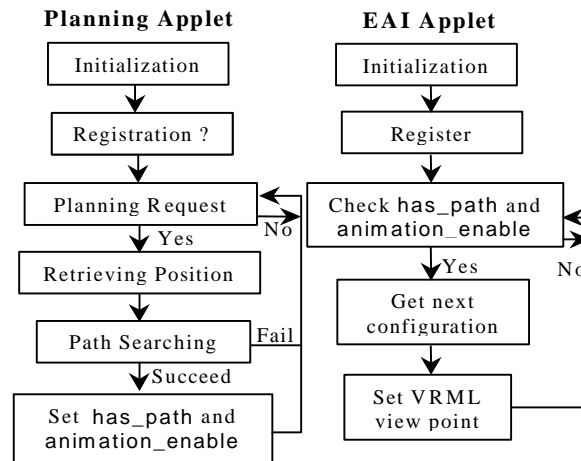
Implementation

- VRML Models
 - ◆ modeling software: 3D studio
 - ◆ add animation functions(e.g. ProximitySensor)
- Path Planning
 - ◆ preprocessing of workspace
 - ◆ path searching
 - ◆ smoothong
- Integration
 - ◆ through web browser(e.g. getAppletContext)

Breadth first search for neighbors



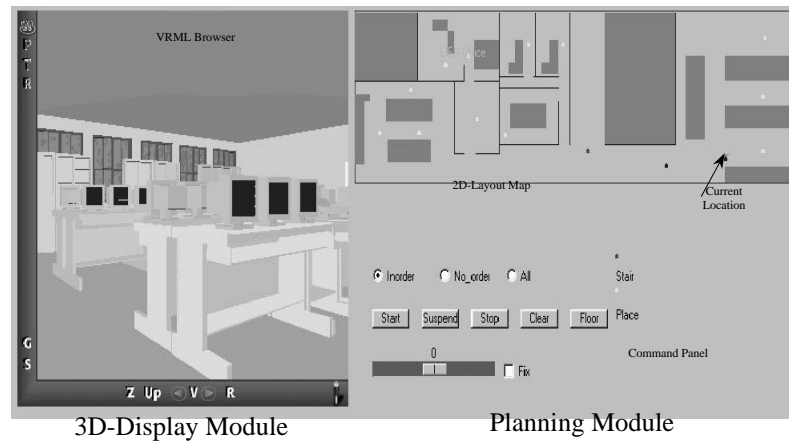
Flow charts for the main loops of the planning and EAI applets



Experimental Results

- User Interface
 - ◆ 3D display browser: WorldView
 - ◆ 2D floor map layout
- Performance
 - ◆ 2D & 3D display time
 - ◆ path length
 - ◆ frame rate

A snapshot of the system's user interface



Conclusion

- Browser Interface
 - ◆ 3D display
- Browser function
 - ◆ add some intelligent agent