Work Summary

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Apollo-Rescue

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Outline

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Large Multi-Agent Systems

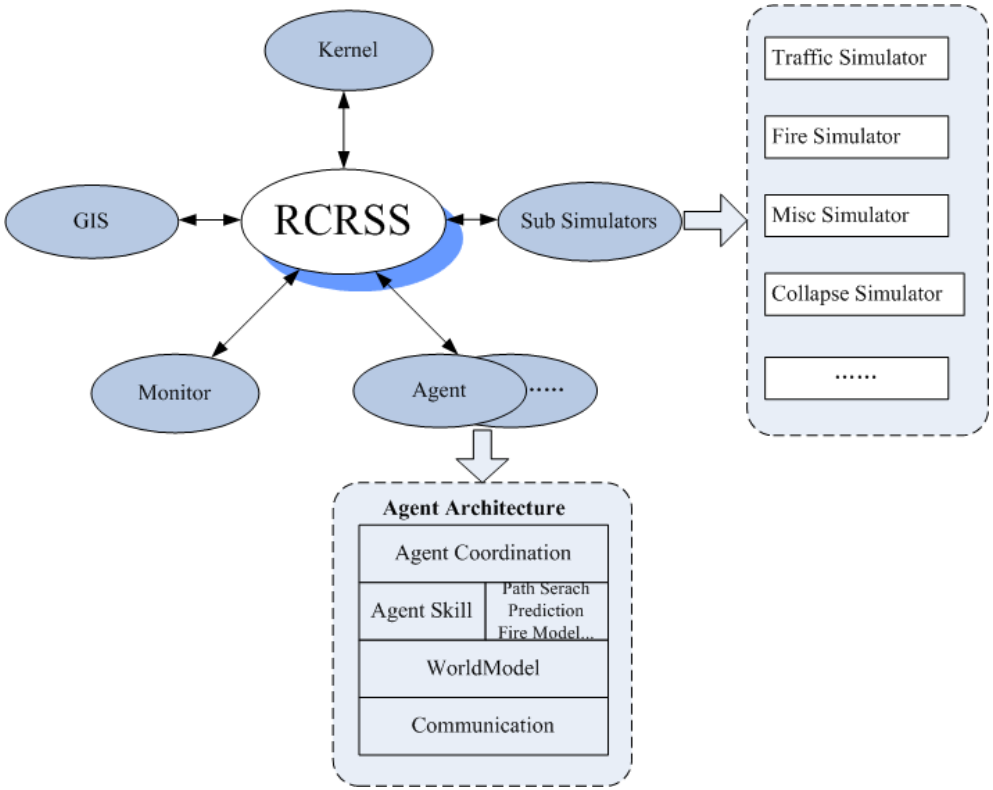
Decision Making Algorithms

Task Allocation Methods

Multi-Agent Coordination and Team Formation Methods

Behaviour Modeling

关于平台 系统结构图


Kernel
GIS
RCRSS
Sub Simulators
Traffic Simulator
Fire Simulator
Misc Simulator
Collapse Simulator
.....
Monitor
Agent
.....
Agent Architecture
Agent Coordination
Agent Skill
Path Serach
Prediction
Fire Model...
WorldModel
Communication

Building

- code (wooden steel concrete)
- area, floors, groundArea , totalArea
- fieryness
- temperature
- energy
- capacity
- wind_speed wind_direction
- and . . .

- Read
- Write
- Trouble Shooting
- Design Pattern

Multi Agent System

智能体协作、协调、协商

Multi Agent System

智能体协作、协调、协商

Algorithm Model

设计合理、有效的算法模型

Multi Agent System

智能体协作、协调、协商

Algorithm Model

设计合理、有效的算法模型

Mathematica Model

最终都是数学模型

Outline

版本控制SVN

版本管理，协作开发

自动化测试脚本

为需要大量、重复的智能体学习、训练提供条件

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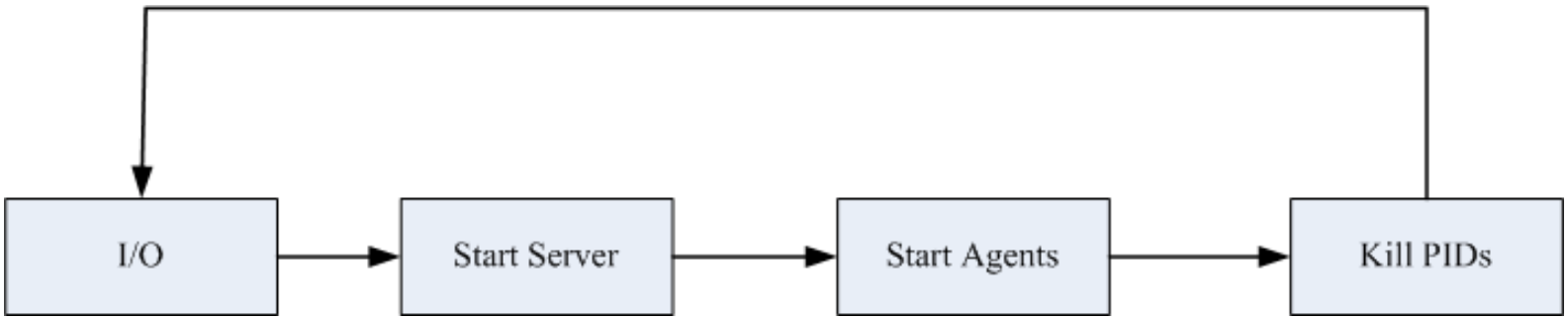
为需要大量、重复的智能体学习、训练提供条件



1. Improve Distributed Decision
2. Test in Path Searching(AStar Search)
3. Test in Region Model Assignment

Outline

Improve Base Code

Safe(Exception) and Nice(Organization)

Improve Base Code

Safe(Exception) and Nice(Organization)

Improve Efficiency

Decision time (One Cycle):

Improve Base Code

Safe(Exception) and Nice(Organization)

Improve Efficiency

Decision time (One Cycle):

- Sense

Improve Base Code

Safe(Exception) and Nice(Organization)

Improve Efficiency

Decision time (One Cycle):

- Sense
- Collection Tasks

Improve Base Code

Safe(Exception) and Nice(Organization)

Improve Efficiency

Decision time (One Cycle):

- Sense
- Collection Tasks
- Select Best Task

Improve Base Code

Safe(Exception) and Nice(Organization)

Improve Efficiency

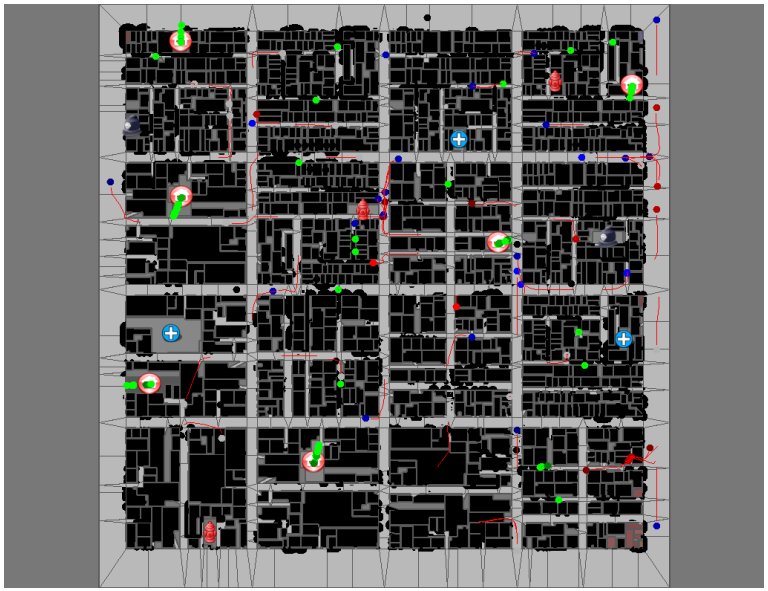
Decision time (One Cycle):

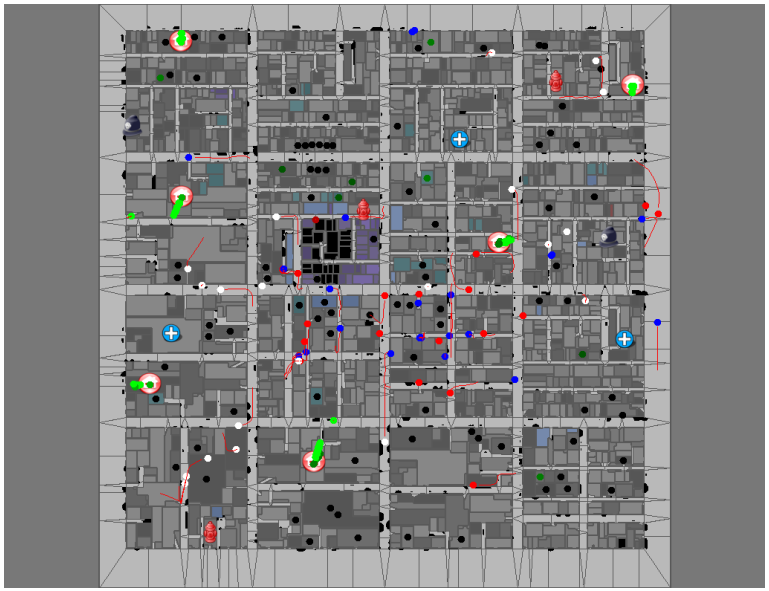
- Sense
- Collection Tasks
- Select Best Task
- Execute

Based on Heuristic Search Algorithm

1. Update World Model about road information
2. Different Heuristic Function corresponding to current condition

Fire Strategy



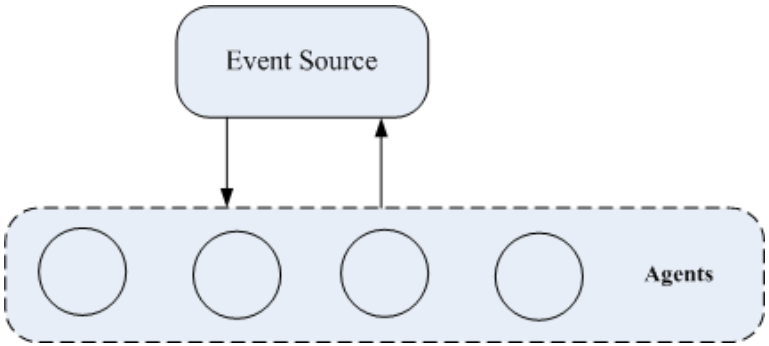


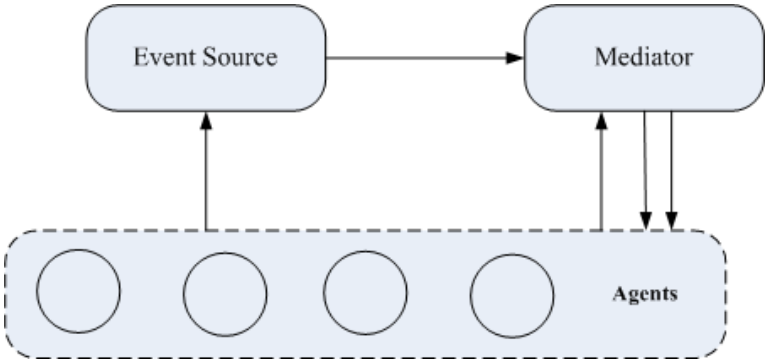
DeathTime Prediction

When to die? Can save?

Hp Damage Buriedness

Coordination





GAP

Generalized Assignment Problem

GAP

$< T, A, C >$

Tasks

Agents

Constraints

Auction

ACO

Heuristic : Priority of task cost

Pheromone : Sequence of task assignment

Common

Cost