

Rescue Simulation League

Agent Competition

Rules and Setup(tentative)

February 4, 2009

- **Simulation Environment:**

1. **Version:**

The Kernel version to be used is based on 0.49.x. This version is available to download at :

<https://roborescue.svn.sourceforge.net/svnroot/roborescue/releases/0.49.x/0.49plus/>

The main changes are:

- a) **New Scoring Scheme**(refer to attached Socer.Vector.pdf)
Score Vector Package is available to download at:
<http://web.iiit.ac.in/~harith/scorevector/>
- b) Building apexes change
- c) New Civilian Simulator(underconsideration)

We strongly encourage all participating teams to use the TCP protocol to connect to the kernel. UDP is still available in 2007 but it is deprecated any may be removed from future competitions.

2. **Hardware environment:** (← We change according to this year's environment)

- a) **PCs for competitions:** There will be 12 pcs. 4 per cluster – meaning 3 clusters in total. On each cluster, one pc is devoted to the viewer. This means it will be possible to run 3 games in parallel.
- b) **Specs. of a PC for kernel and agents:** Dell, Dual Core E2160 1.8Ghz, 80G HD, 1GB RAM, 17”LCD, DVD ROM,.
- c) **Graphics card for PC for 3D viewer:** GeForce6600GT .

3. **Operating System:** A Linux package will be used.

- The Kernel will generate random IDs for units in each simulation. This means that the ID generated for a building in each simulation will be different from the next one.

4. **Maps:** A range of maps will be used including:

1. Maps known to all teams
 - center of Foligno (Italy)
 - Kobe (1/10, 1/4)(Japan)
 - Virtual City
2. A number of random (or modified standard maps).
3. There will be scenarios where there are no centres and no communication is allowed on channels 1 to 9. Only channel 0 will be available for communication. The percentage of maps where these scenarios will be run will be as follows: 1 or two for Preliminaries, <= 30% for Semis, and <= 50% for the Final.

5. **Agents:** Agents shall be implemented by Teams.

1. **Numbers:** The numbers of agents and ignition points specified in gisini.txt are shown in Table 1. The numbers are open to contestants before games.

Table 1: The number of agents and ignition points specified in gisini.txt

Entity	Min.	Max.
Fire Brigade	0	20
Police Force	0	20
Ambulance	0	15
Civilian	70	145
Fire Brigade Center	0	1
Police Force Center	0	1
Ambulance Center	0	1
Refuge	0	5
Ignition points	2	8*

* The maximum number of initial burning buildings is set at **30**.

However these buildings will be grouped into no more than **8** different areas - i.e. there will be up to 8 initial fires, but they might begin with several burning buildings each.

6. **Parameters uses in games:**

1. parameters in config.txt[kernel]: Default parameters are used.
- 2.
- 3.
4. Default parameters are used.
- 5.
6. round_hp_and_damage: true
- 7.
8. send_voice_synchronously: false
- 9.
- 10.
- 11.
12. # New options for 2005
- 13.
14. send_civilians_at_start: false
- 15.
- 16.
- 17.
18. #####
- 19.
20. # new/modified options for the 2004 competition.
- 21.
- 22.
- 23.
24. # GIS generates random IDs for units in each simulation.
- 25.
26. random_IDs : true

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27.
28.
29.
30. # KA_HEAR_TELL and KA_HEAR_SAY are added to the RoboCup
    Rescue protocol.
31.
32. additional_hearing      : true
33.
34.
35.
36. # The maximum power of one extinguish action. (-1 to
    unlimit)
37.
38. max_extinguish_power_sum      : 1000
39.
40.
41.
42. # The maximum extinguish power for each nozzle. (-1 to
    unlimit)
43.
44. max_extinguish_power        : -1
45.
46.
47.
48. # The maximum number of nozzles for one extinguish action.
    (-1 to unlimit)
49.
50. max_nozzles                 : -1
51.
52. max_extinguish_distance: 30000
53.
54.
55.
56. #####
57.
58. # new options for the 2003 competition.
59.
60.
61.
62. # avoid slowdown for spreading fire.
63.
64. send_far_fire_changed_only    : true
65.
66. # notify_unchangeable_informaion      : false // Deprecated
67.
68.
69.
70. # avoid that the fire simulator becomes some laps behind.
71.
72. step                          : 1000
73.
74.
75.
76. # use new synchronization mechanism.
77.
78. # use_gettimeofday              : false // Deprecated
79.
80.
81.
82. # An agent can discover a fire within a distance D[m]
    roughly proportional
```

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83.
84. # to its fieryness, where
85.
86. #      D = K * (cycles from the start of burnup)
87.
88. # If fire_cognition_spreading_speed >= 0, K is given by
89.
90. # fire_cognition_spreading_speed. Otherwise, K is infinite.
91.
92. fire_cognition_spreading_speed : 10000
93.
94.
95.
96. # If simulate_tank_quantity is true, tank quantity
   properties are
97.
98. # decreased by extinguishments. If tank is empty,
   extinguishments
99.
100. # should be faild.
101.
102. simulate_tank_quantity          : true
103.
104.
105.
106. # Tank quantity properties are increased by
   tank_quantity_recovery_on_refuge
107.
108. # if the agent is in a refuge.
109.
110. tank_quantity_recovery_on_refuge : 1000
111.
112. # same as max_extinguish_power
113.
114.
115.
116. # Gives the maximum quantity of a tank.
117.
118. tank_quantity_maximum           : 15000
119.
120.
121.
122.
123.
124. # not new, but the subject of the discussion
125.
126. say_max_bytes                   : 256
127.
128.
129.
130.
131.
132. #####
133.
134. # new options for the 2002 competition.
135.
136.
137.
138. ignore_nozzle_position          : true
139.
140. area_per_repair_cost            : 20000000

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141.
 142. round_down_quantity : false
 143.
 144. accept_multiple_nozzles : true
 145.
 146. near_agents_rescuable : true
 147.
 148. steps_far_fire_invisible : 5
 149.
 150. steps_agents_frozen : 3
 151.
 152. miscsimulator_supports_load : false
 153.
 154. :
 155.
 156. Other parameters:

- simulation time: 300 steps,
- range of eyesight is 10m,
- range of voice is 30m,
- power of earthquake: shindopolydata.dat, galpolydata.dat

• Rules

1. The Technical Committee shall design the disaster situations to be used during the competitions. Disaster situations chosen for a competition shall be able to test efficiency of agents' task in various conditions.
2. Simulations held in each day of competitions shall be divided into Sessions. A 'Session' is a group of Simulations held on a specific disaster situation in a round.
3. Teams shall submit their code/binary **at the start of each day**.
4. Teams shall NOT know the disaster situation (map, gisini, *polydata, random seeds, *.rays) of the session before it starts.
5. Teams can either modify their code or submit new code every day.
6. Teams shall have all kinds of agents and must connect the correct number of agents as specified for the current session.
7. *Precomputation* defined as an agent's loading and using MAP-SPECIFIC data which has been created and processed by another program and saved in a file is allowed under the following conditions:
 1. The data should have been generated by a computer program with no human interaction.
 2. Information for all known maps should have been generated by a single computer program.
 3. The computer program used for computing data for known maps should work properly if it is given a new map.
 4. An agent should choose the data file to be used itself.
 5. Agents should be able to work if no precomputed data is present for a map.
 6. The source of the precomputation program shall be open after the competition.
 7. A simulation should start within 5 min from agents' connections.
8. **Number of simulations in each round:** In each round there shall be more than one simulation on the same map. The number shall be determined and announced on competition site by TC. The score for that round shall be determined by finding the average of the points for the runs.

9. **Evaluation Rule(old):** We will use new score scheme. You can see the detail evaluation rule on the document(Score.Vector.pdf). In this section, we explain an old scoring rule(from German Open 2005 to RoboCup2008). The scoring was intended to take the new aspects of the fire simulation into account.

- The higher V value for a map, the better rescue operation.

$$V = \left(P + \frac{S}{S_i} \right) \times \sqrt{\frac{B}{B_i}}$$

P : number of living agents,

S_i : total HP of all agents at start,

S : remaining HP of all agents,

B_i : total area at start,

B : area of houses that are undestroyed,

- the following rule was used to compute the value B:

0 no penalty

1,5 1/3 of area counted as destroyed

4 water damage, also 1/3 area counted as destroyed

2,6 2/3 of area considered as destroyed

3,7,8 whole building considered as destroyed

10. **Valid games:** A game may fail with various reasons, although simulation package is debugged. Such situations are as follows:

- a) Some simulators stopped.
- b) Some agents stopped.

In that case, only **ONE** more simulation is permitted. When the second game also failed, we judge as follows:

1. In the case that the simulation continues to the end, the score of the second game is counted. If a second game is attempted, the score from the first game is not counted.
2. In the case that the simulation does not continue to the end, the point is 0. Even if the first game score is higher, the first game score cannot be counted, you can't choose the point.

11. It is the responsibility of teams to ensure that their code works correctly with the provided simulators. Although the technical committee makes every attempt to provide a reliable simulation environment the committee accepts no responsibility for any kind of software failure at competition time. Bugs reported at competition time will be fixed at the first opportunity but generally this will be after the competition has ended.
12. **Others:** All the conditions for a particular disaster situation, including random numbers, etc shall be identical for all the teams.
13. **Comments from teams:** occasionally, members of participating teams may wish to voice concerns or make suggestions to the TC about the running of the competition. If these comments or suggestions are deemed derogatory or abusive, the team concerned shall be penalised, with prior consultation with Robocup

Trustees on the matter. Penalties may include points reduction, or, in the worst case, disqualification.

14. **Open source policy:**

- Source code files must be open immediately after games when other teams request to guarantee fair play and to encourage community activity after competition.
- Log files and related parameter files will be open.

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Gopal Ramchurn, Yannis Vetsikas and Nobuhiro Ito, 2009-2-4