ROBOCUP 2017

IN SUMMARY

Amirreza Kabiri
Fatemeh Pahlevan Aghababa

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OUTLINE

- Models
- Hardware Specifications
- Software Specifications
- Game Field Specifications
- RoboCup2017RVRL_Demo Repository
- How to setup
- How to use
- Results
MODELS

- Robot:
  - pioneer3at

-Victims:
  - Alive victim
    - Hot victim
      - The hot victim can be seen in “white” color by using a thermal camera.
    - Mowing victim
      - The moving victim is waving his right arm.
    - Voice victim
      - The voice victim is saying "Help me"
  - Dead victim
    - Dead victim is not hot, is not moving his arm and is not saying anything.
MODELS

- Note that, in all games, only Hot victims and Dead victims were used. Because Moving victims took CPU power too much and almost all of teams wanted to use their own pioneer3at models that did not have a microphone.

- Sensor parameters were:
  - HOKUYO:
    - The number of beams: 1040
    - Frequency: 30
  - Camera:
    - Resolution: 320 x 240
    - Frequency: 30
  - Thermal Camera:
    - Resolution: 160 x 120
    - Frequency: 10
MODELS
HARDWARE SPECIFICATION

- Game’s field models were big and heavy. So, in order to running these fields you should use a desktop machine with good graphic card.

- Common specification of PCs used in RC2017RVRL
  - CPU: intel Core i7 4790K 4GHz 8 cores
  - MEM: 16G Bytes
  - GPU: nVidia GTX 1070
SOFTWARE SPECIFICATION

- Ubuntu 16.04 LTS
  Install Ubuntu 16.04 LTS (64bit)

- ROS Kinetic and Gazebo7 from PPA
  Ubuntu install of ROS kinetic
  Install Gazebo using Ubuntu packages

✔ You can either install the specifications using the above links for follow the next 2 slides.
sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
sudo apt-key adv --keyserver hkp://pool.sks-keyservers.net --recv-key 0xB01FA116

sudo sh -c 'echo "deb http://packages.osrfoundation.org/gazebo/ubuntu `lsb_release -cs` main" > /etc/apt/sources.list.d/gazebo-latest.list'
écho 'deb http://packages.osrfoundation.org/gazebo/ubuntu `lsb_release -cs` main' >> /etc/apt/sources.list.d/gazebo-latest.list

gpg -o /etc/apt/trusted.gpg.d/gazebo-latest.list.gpg -f 0xB01FA116

wget http://packages.osrfoundation.org/gazebo.key -O - | sudo apt-key add -
sudo apt-get update

dsudo apt-get install -y cmake g++ protobuf-compiler pavucontrol libgazebo7 libgazebo7-dev

ros-kinetic-desktop ros-kinetic-gazebo ros-pkgs ros-kinetic-gazebo-ros-control ros-kinetic-ros-control

ros-kinetic-ros-containers
SOFTWARE SPECIFICATION - INSTALL

ros-kinetic-image-view2 ros-kinetic-rqt ros-kinetic-rqt-common-plugins ros-kinetic-joy
ros-kinetic-teleop-twist-keyboard ros-kinetic-message-to-tf ros-kinetic-tf2-geometry-msgs
ros-kinetic-audio-common ros-kinetic-costmap-2d ros-kinetic-image-transport
ros-kinetic-image-transport-plugins ros-kinetic-hector-mapping ros-kinetic-hector-geotiff
ros-kinetic-hector-pose-estimation ros-kinetic-hector-gazebo-plugins ros-kinetic-hector-gazebo-worlds
ros-kinetic-hector-sensors-description

sudo rosdep init
rosdep update
sudo apt-get install -y python-rosinstall

gazebo
Software Specification – Gazebo 7 Problems with Game Fields

- Gazebo 7.7.0 used in the final round.
- In Gazebo version 7.8.1
  - pioneer3at robot written in sdf wasn’t doing well.
- In Gazebo version 7.0.0
  - pioneer3at Robot written in both sdf & urdf format was doing well.
  - world model of 2nd run in final round could not be loaded.
- Gazebo version 7.7.0
  - pioneer3at Robot written in sdf format was doing well.
  - world model of 2nd run in final round could be loaded.

- If you can not install gazebo version 7.7.0 in binary package, you can install it using source code from here.
This repository includes a robot model and field models used in RoboCup World Championship 2017 Rescue Simulation Virtual Robot League (RC2017RVRL).

You can find other records of the RC2017RVRL game in [wiki page of this repository](#).

Rescue Simulation Virtual Robot 2017 rule is in [the rescue virtual robot league wiki page](#).
GAME FIELD SPECIFICATIONS

❖ In this year, 5 fields were used
  ➢ 3 field for preliminary games
  ➢ 2 field for final game

❖ All the game field models are in the RoboCup2017RVRL_Demo repository and you can use it by following the instruction in “How to set up” section
# Game Field Specifications

<table>
<thead>
<tr>
<th>Game</th>
<th>Size</th>
<th># of robots</th>
<th># of alive victims</th>
<th># of dead victims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary 1</td>
<td>88m x 92m</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Preliminary 2</td>
<td>90m x 70m</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Preliminary 3</td>
<td>220m x 200m</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Final 1st run</td>
<td>154m x 162m</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Final 2nd run</td>
<td>104m x 204m</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>
GAME FIELD SPECIFICATIONS

- **GREEN** rectangles are alive victim’s location.
- **RED** rectangles are dead victim’s location.
- **BLUE** rectangles are robot’s start locations.
  - Note: if there is only one Blue rectangle in the field, it means that all the robots will start from that position.
In the game, this victim was alive. But in this repository, this victim is dead.
MAP
PRELIMINARY 2
MAP
PRELIMINARY 3

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HOW TO SETUP

- You can get RoboCup2017RVRL_Demo repository by Typing the following commands in a terminal:

  $ cd
  $ git clone https://github.com/m-shimizu/RoboCup2017RVRL_Demo
In order to use RoboCup2017RVRL_Demo repository, you should build packages by typing the following commands in a terminal:

```bash
$ cd ~/RoboCup2017RVRL_Demo
$ catkin_make
```
HOW TO USE

❖ At first, following commands should be run in each open terminal:

$ cd

$ cd RoboCup2017RVRL_Demo

$ source setup.bash

❖ Now you can run the files in the repository

❖ In order to increase stability, server side launch files were improved after each game by checking the connectivity between the game servers and all team's own robot control software

❖ Note: For each team, you should use a set of terminals and remember to run the above command in each of them.
HOW TO USE - CONTROL ROBOTS

❖ At first, you should check each robot’s topic names.

❖ Following command are an example in which pioneer3at_ros robot was spawned.

```
$ rostopic list
$ rosrun teleop_twist_keyboard teleop_twist_keyboard.py
cmd_vel:=/pioneer3at_ros/cmd_vel
```
RESULTS

Everyday Team Leader Meeting will be held at 10:00

Final Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>CKA SDF, Yildiz SDF, Echic UDF</td>
</tr>
<tr>
<td>13:00</td>
<td>MRL SDF, SOS UDF, CKB SDF, Echic UDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKA</td>
<td>3, 0, 20</td>
</tr>
<tr>
<td>CKB</td>
<td>2, 0, 20</td>
</tr>
<tr>
<td>Echic</td>
<td>3, 0, 55</td>
</tr>
<tr>
<td>MRL</td>
<td>2, 0, 20</td>
</tr>
<tr>
<td>SOS</td>
<td>2, 0, 66</td>
</tr>
<tr>
<td>Yildiz</td>
<td>4, 0, 88</td>
</tr>
</tbody>
</table>

Map Size: 90m x 70m, 220m x 200m

Next year issues:
- Certification Finalist
- Technical Challenge
- Victim Voice, Moving, Hot Decay
- Noise present score
- Scoring
- Dead Victim

Formulas:

Score = 50 [10m + 10% MS] x 10

Ask the present score - 50 [10m + 10% MS] = The year Zero

- Pre-Liminary 1: 5 alive victims. Sorry. No dead victim.
- No moving victims, no voice victims.
- Final Start @ point. has 2 games for each team.
  - for 5 min Handoff from 10th min

T. C. Election Nominees

Mahdi Salamati
Salih Maragheh

But first I have to ask question to TC

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