



ROBOCUP 2017

IN SUMMARY

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MODELS

❑ Robot:

- pioneer3at

❑ Victims:

➤ Alive victim

■ Hot victim

- ✓ The hot victim can be seen in “white” color by using a thermal camera.

■ Moving victim

- ✓ The moving victim is waving his right arm.

■ Voice victim

- ✓ The voice victim is saying "Help me"

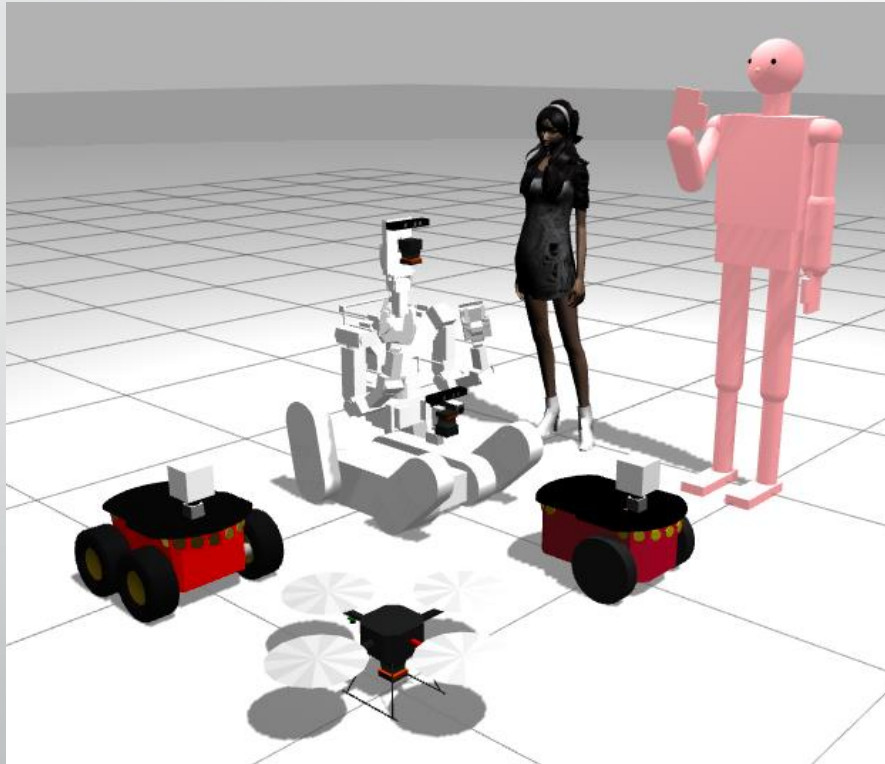
➤ Dead victim

- ✓ 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.

SOFTWARE SPECIFICATION- INSTALL

```
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'
```

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

```
sudo apt-get update
```

```
sudo apt-get install -y cmake g++ protobuf-compiler pavarcontrol libgazebo7 libgazebo7-dev
```

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

```
ros-kinetic-ros-controllers
```


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](#).

ROBOCUP2017RVRL_DEMO REPOSITORY

- ❖ 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

Game	Size	# of robots	# of alive victims	# of dead victims
Preliminary 1	88m x 92m	4	4	1
Preliminary 2	90m x 70m	4	4	4
Preliminary 3	220m x 200m	4	4	4
Final 1st run	154m x 162m	4	4	4
Final 2nd run	104m x 204m	4	4	6

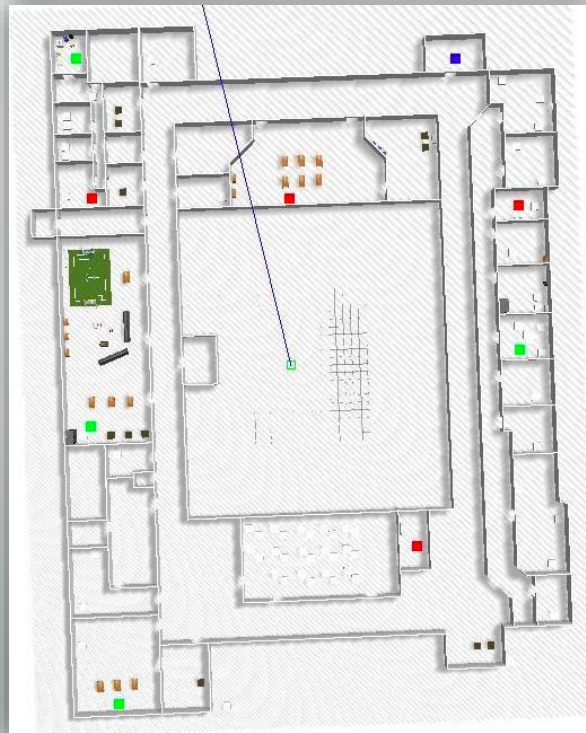
GAME FIELD SPECIFICATIONS

- **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.

MAP PRELIMINARY 1



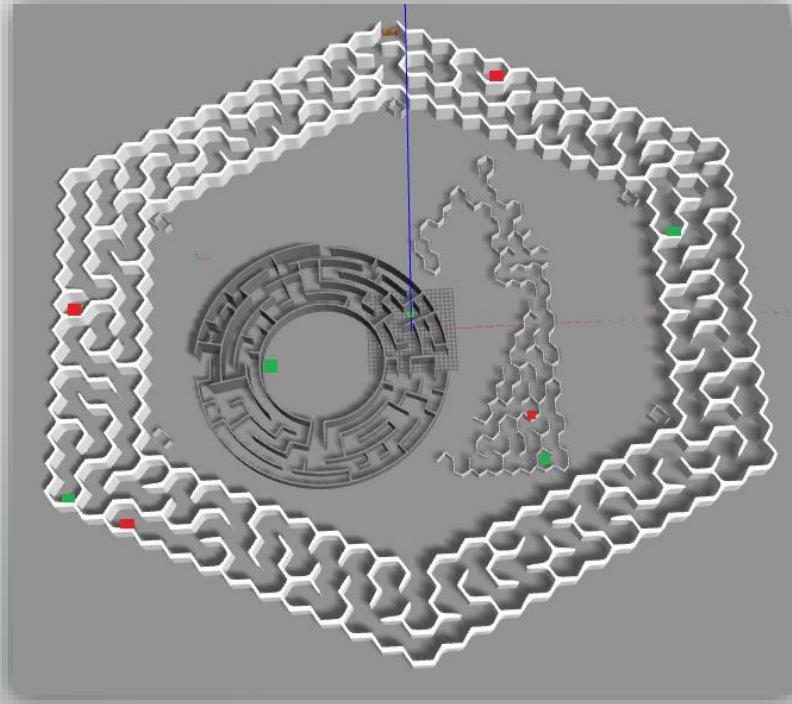
MAP PRELIMINARY 2



MAP PRELIMINARY 3



FINAL 1ST RUN



FINAL 2ND RUN



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
```

HOW TO USE

- ❑ In order to use RoboCup2017RVRL_Demo repository, you should build packages by Typing the following commands in a terminal:

```
$ 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
```

```
$ rosrn teleop_twist_keyboard teleop_twist_keyboard.py
```

```
cmd_vel:=/pioneer3at_ros/cmd_vel
```

RESULTS

VR information

Everydays Team Leader Meeting will be held at 10:00

Next year issues →

- Certification Finalist
- Technical Challenge
- Map Making Method
- Victim: Voice, Moving, hot decoy
- Noise appresen score
- Scoring → Auto MARKING
- dead Victim

	① $\alpha=1, \beta=1, M=5$	② $\alpha=1, \beta=1, M=8$	③ $\alpha=2, \beta=1, M=5$	
	PreL1 (27)	PreL2 (28)	PreL3 (29)	Final (30)
Final Schedule	CKA SDF	CKB SDF	Yildiz SDF	SOS 108
① 11:00	Yildiz SDF	Echoic URDF	CKB SDF	Yildiz 105
	MRL SDF	MRL SDF	SOS URDF	Echoic 69
② 13:00	SOS URDF	SOS URDF	CKA SDF	CKB 0
	CKB SDF	CKA SDF	Echoic URDF	SOS 115
	Echoic URDF	Yildiz SDF	MRL SDF	Yildiz 133
				Echoic 48
				CKB 0
CKA	M S Score 0, 0, 0	M S Score 0, 0, 0	M S Score 2, 0, 40	40
CKB	2, 0, 20	2, 0, 20	3, 0, 60	80
Echoic	3, 0.54, 57	1, 0.34, 37	3, 0.06, 70	127
MRL	2, 0, 20	2, 0, 20	0, 0, 0	40
SOS	2, 0.95, 67	3, 0.61, 79	3, 0.27, 103	182
Yildiz	4, 0.96, 88	4, 0.80, 104	1, 0.95, 172	276
Map Size	$\alpha \times m$	90m x 70m	220m x 200m	

Formulas

$$\text{Score} = 50 \left[10m + (1 - \frac{1}{M}) \right] \alpha$$

$$\text{Score} = [10m + 10\beta MS] \alpha$$

This year zero

Q: Team presentation → Task the presen-score Sunday Morning

Pre-Limnary 1: 5 alive victims. sorry. (no dead victim)

No moving victims, no voice Victims.

Final Start 0 point.

has 2 games for each team.

for 5 minnt Hands off from 10th minute

T.C. ELECTION NOMINEES

Please write a candidates name!

Mahdi Salamati

Salih Maraghe
(But first I have to ask questions to TC)

4 alive Victims