

# YILDIZ

## Rescue Simulation League

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RoboCup  
Eindhoven 2013

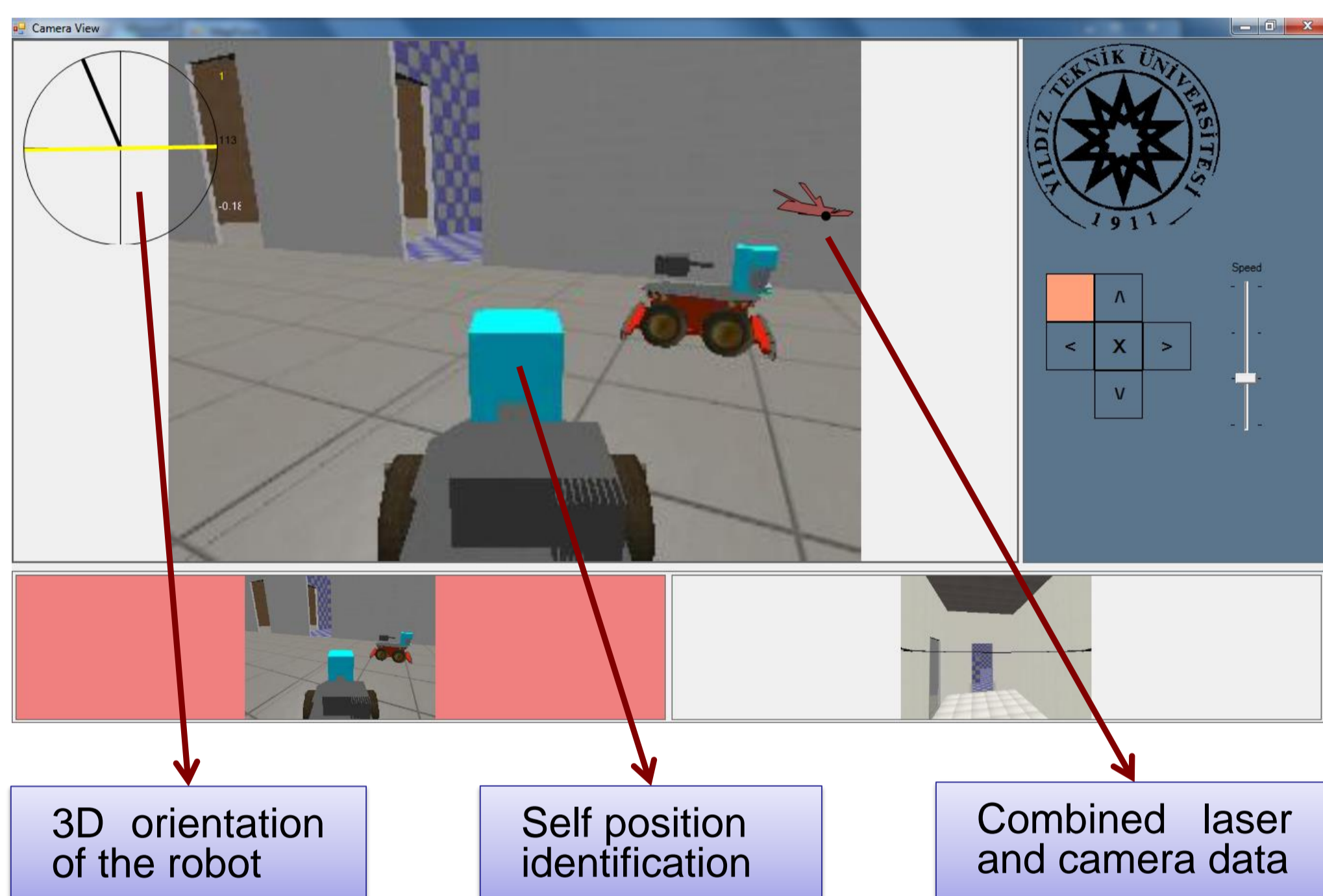


### Achievements and Contributions of Team YILDIZ

- 2<sup>nd</sup> place in RoboCup Iran Open 2012
- 2<sup>nd</sup> place in RoboCup World Championship 2012
- 1<sup>st</sup> place RoboCup Iran Open 2013

### User Interface

#### Control Interface



3D orientation of the robot

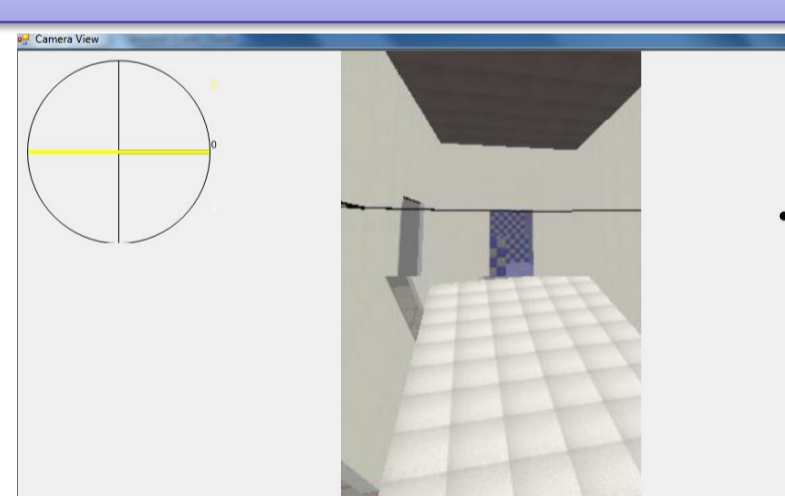
Self position identification

Combined laser and camera data

#### Map Interface



Combined image of two cameras on AirRobot



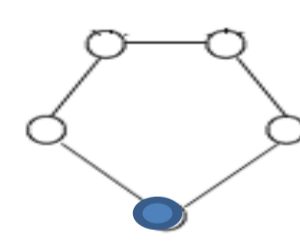
### Air Robot Localization



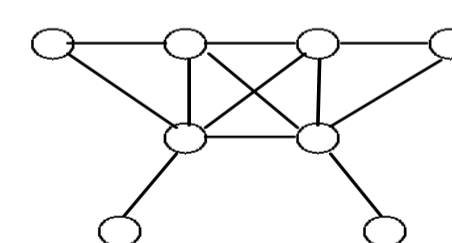
### Effective Message Passing

Blind flooding (BF) and Table-based routing (TB) propagation models of WSS

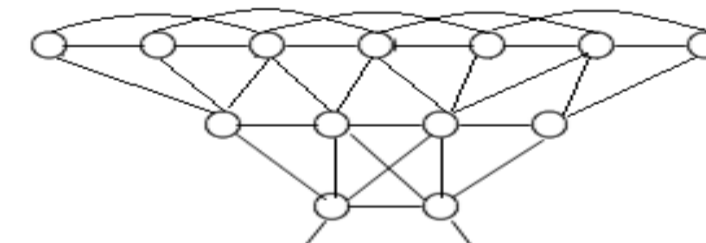
Scenario	Method	Total Package Speed (pck/sec)	Package Speed for each robot (pck/sec)
I	BF	132.45	33.11
I	TB	398.32*	99.58
II	BF	43.52	5.44
II	TB	312.76*	39.09
III	BF	15.16	1.01
III	TB	229.11*	15.27



Scenario I



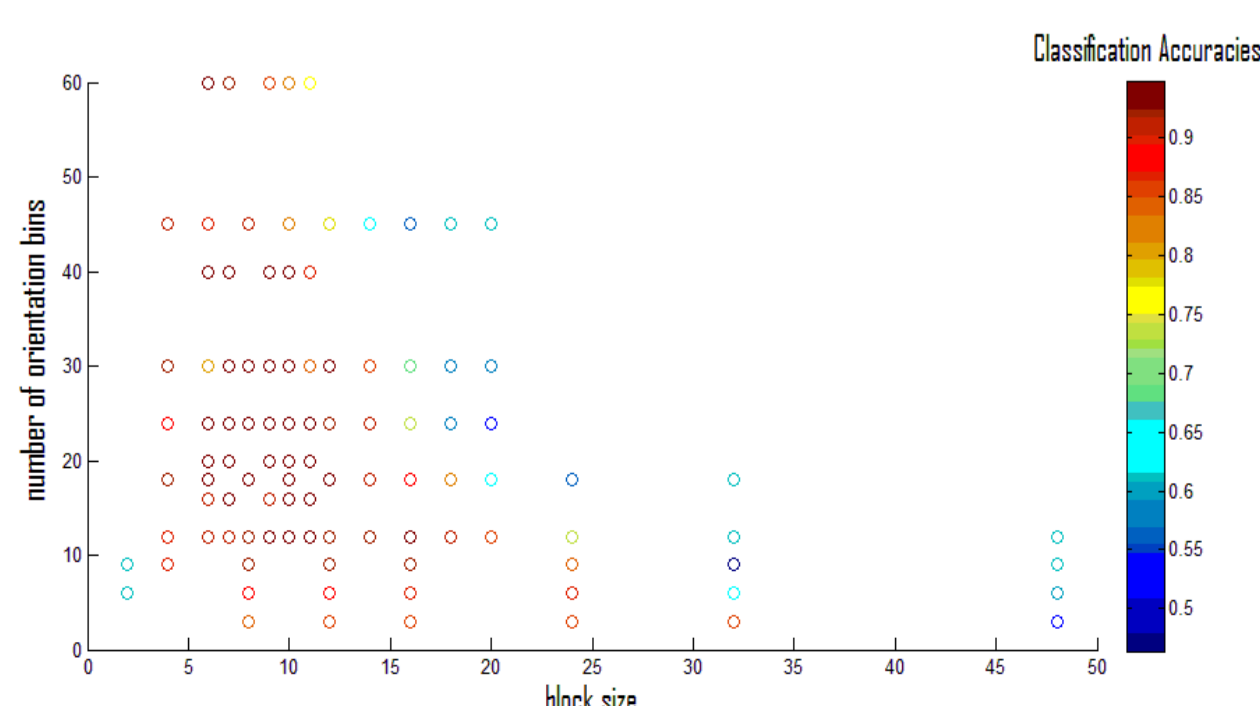
Scenario II



Scenario III

### Autonomous Victim Detection

Usage of Histograms of Oriented Gradients



### Autonomous Navigation

To navigate autonomously our algorithm first selects a point based on following potential formula:

$$P = w_1 \cdot dist(point, robot) + w_2 \cdot (\#of\ undiscovered\ neigh)$$

Afterwards, robot moves to the point which has the greatest potential using a special version of A\*

$$F = dist(start, current) + apprxdist(current, finish) + penalty(current)$$

$$penalty(current) = \#of\ neighbouring\ obstacles$$

