



RoboCup : Insights on Its Success and Challenges

Manuela Veloso
Carnegie Mellon University

IROS'15 Workshop:

Robot Competitions: What did we learn?

RoboCup

- “By 2050, a team of soccer robots will defeat the World Cup champion human soccer team”

RoboCup Beginnings

- 1993: discussion on the idea of robot soccer in Japan. (also Mackworth paper)
- 1996: Researchers from Japan (Kitano, Asada, Noda), US (Veloso, Stone), and Europe (Duhaut, Pagello, Coradeschi) join at an IROS workshop **to create RoboCup.**
- 1997: First International RoboCup *with IJCAI'97* in Nagoya, Japan
 - **Simulation, small-size, middle-size**

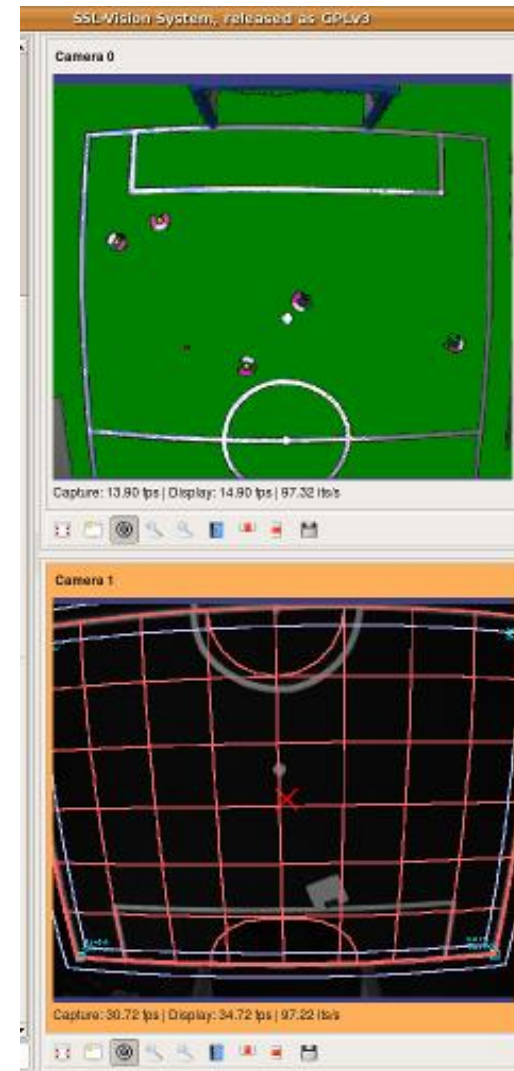
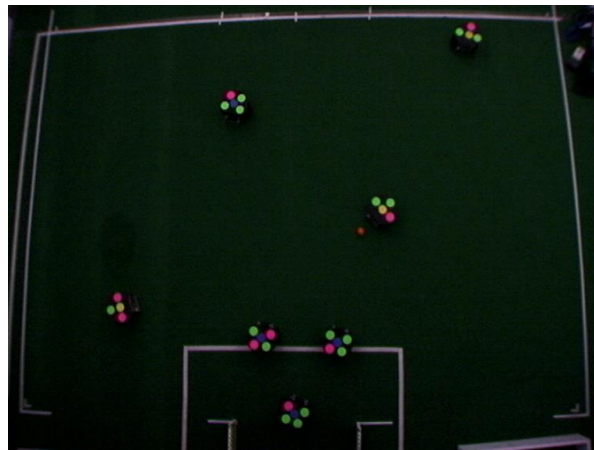
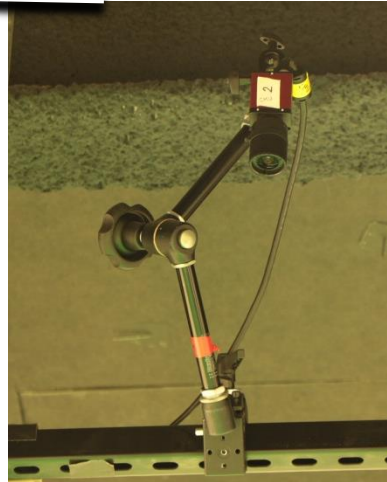
Simulation

- A software server that simulates the physical environment, realism, noisy, stamina
- Gets commands from software clients, performs them in the simulator for a new state.



RoboCup "Small-Size" Soccer

Centralized Perception, Cognition, and Distributed Action



RoboCup “Middle-Size” Soccer

Onboard Perception, Cognition, and Action (Communication, Omnivision)



RoboCup Leagues 2015

- **RoboCup Soccer**
 - Simulation League
 - Small Size Robot League
 - Middle Size Robot League
 - Standard Platform Robot League
 - Humanoid League
- **RoboCup Rescue**
 - Rescue robot
 - Rescue simulation
- **RoboCup@Home**
- **RoboCup@Work**
- **RoboCupJunior**

RoboCup

- 1997 – Nagoya, Japan
- 1998 – Paris, France
- 1999 – Stockholm, Sweden
- 2000 – Melbourne, Australia
- 2001 – Seattle, USA
- 2002 – Fukuoka, Japan
- 2003 – Padova, Italy
- 2004 – Lisbon, Portugal
- 2005 – Osaka, Japan
- 2006 – Bremen, Germany
- 2007 – Atlanta, USA
- 2008 – Suzhou, China
- 2009 – Graz, Austria
- 2010 – Singapore
- 2011 – Istanbul, Turkey
- 2012 – Mexico City, Mexico
- 2013 – Eindhoven, Holland
- 2014 – Joao Pessoa, Brazil
- 2015 – Hefei, China
- 2016 – Leipzig, Germany

Rescue, @Home, @Work



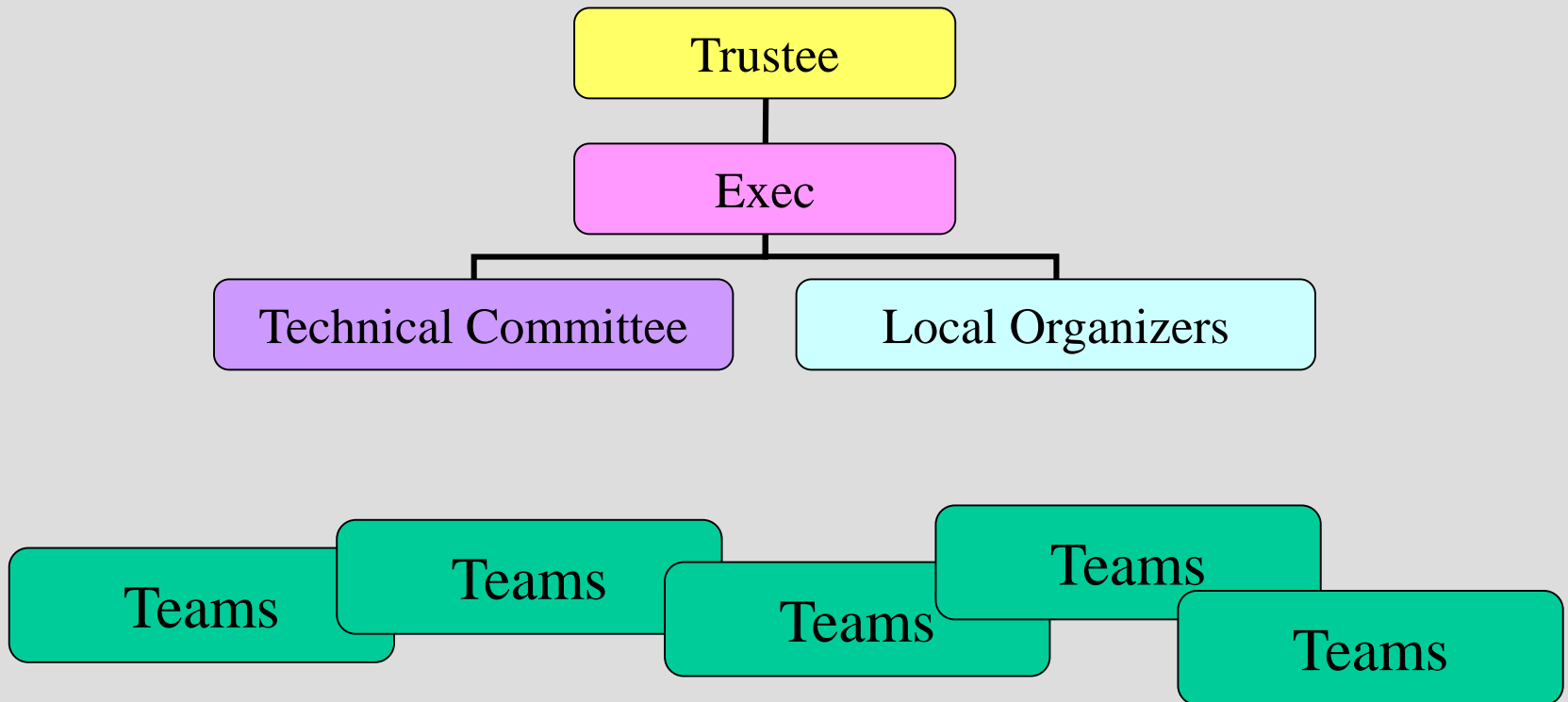
RoboCup Success

- RoboCup Symposium
 - Engineering, Theory, Sharing Awards
- Sharing of solutions
- Incremental
 - Change every year
- Reachable
- Exciting
- Flexible
- Inclusive

RoboCup Organization

- The Federation
 - Business Office
- Trustees
- Execs
- Technical Committees
- National Committees
- Participating Teams

League Structure





Research and Public Interest

