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