A software toolset for quick humanoid motion prototyping

Fabio DallaLibera*, Takashi Minato†, Hiroshi Ishiguro†‡,
Enrico Pagello*, Emanuele Menegatti*

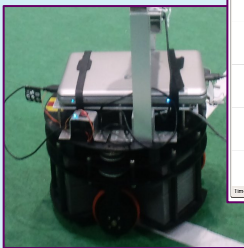* DEI, Padua University, Italy
† JST ERATO, Osaka, Japan
‡ Dept. of System Innovation, Osaka University, Japan

Humanoid Soccer Robots @ IEEE-RAS Humanoids09

Background

Mobile robots

player/stage is used by many research groups
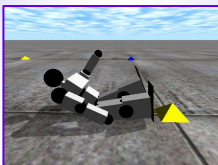
Humanoid robots

Many powerful simulators and related projects available
- SimSpark
- USARSim
- Gazebo
- Simbad
- SimRobot
- Webots
- PAL
- ...

None imposes over the others

Often researchers need
- fast prototyping
- ability to understand and modify the code to meet specific needs

No time to learn how to use complex software

Many researchers directly use physical simulation libraries (e.g. ODE)

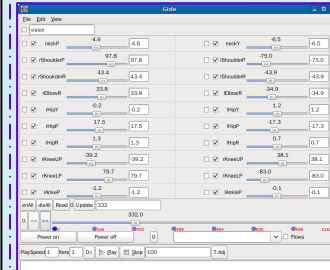**Much time wasted in implementing similar things**

Realize a software toolset for humanoid motion development fully understandable in limited time

Features

Gtkmm motion development interface

storage as simple text files

Multi-robot simulation

Easily customizable environment

simulation of robot sensors (camera, touch)

communication through text messages over TCP-IP

Same interfaces for the real and simulated robot

```
Motor
rotate(double*)
setPower(bool*)
```
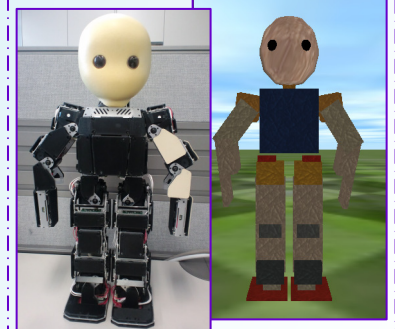
Fast kinematic chain modeling using XML files

built in interaction with the simulated objects

Examples of usage

- **Study of touch instructions** F. DallaLibera, T. Minato, I. Fasel, H. Ishiguro, E. Pagello and E. Menegatti, A new paradigm of humanoid robot motion programming based on touch interpretation, RAS, Vol. 57, No 8, pp.846-859, 2009
- **Programming of CPGs by touch** F. Dalla Libera, T. Minato, H. Ishiguro and E. Menegatti, Direct Programming of a Central Pattern Generator for Periodic Motions by Touching, RAS, Special Issue on Advances in Autonomous Robots for Service and Entertainment, 2009
- **JEAP RoboCup team**