Survey response 11

Software

Team Name
NimbRo

Is your software fully or partially OpenSource. If so, where can it be found:
Partially: https://github.com/AIS-Bonn/humanoid_op_ros

Do you have a kinematic or dynamic model of your robot(s)? If so, how did you create it (e.g. measure physical robot, export from CAD model)?
We have both models, we created the, from CAD model.

Are you using Inverse Kinematics? If so what solution (analytic, (pseudo)inverse jabcobian, etc...) are you using?
Yes, analytical solution.

Are you simulating your robot? If so what are you using simulation for?
Yes, we use simulation for gait development.

What approach are you using to generate the robot walking motion?
https://arxiv.org/abs/2011.02793

What approach are you using to generate motions for standing up?
We do not stand up.

What approach are you using to generate kicking motions?
Omnidirectional Gait with In-walk Kick (https://arxiv.org/abs/1912.07405)

Do you use any other motions than the previously mentioned? If so, what approaches are you using to generate them?

Which datasets are you using in your research? If you are using your own datasets, are they public?
We use our own private dataset for perception training.

What approaches are you using in your robot's visual perception?
Deep Neural Net.

Are you planning with objects in Cartesian or image space? If you are using Cartesian space, how do you transform between the image space and cartesian space?
Yes, we plan in Cartesian space, we use robot TF for projection.

How is your robot localizing?
By EKF using field lines, center circle, goalposts.

Is your robot planning a path for navigation? Is it avoiding obstacles? How is the plan executed by the robot (e.g. dynamic window approach)?
We plan for navigation and avoid obstacles, as explained here: https://arxiv.org/abs/1909.02385

How is the behavior of your robot's structured (e.g. Behavior Trees)? What additional approaches are you using?
Finite State Machine.

Do you have some form of active vision (i.e. moving the robots camera based on information known about the world)?
Yes.

Do you apply some form of filtering on the detected objects (e. g. Kalman filter for ball position)?
Yes.

Is your team performing team communication? Are you using the standard RoboCup Humanoid League protocol? If not, why (e.g. it is missing something you need)?
We use our own protocol for team communication. We find our approach more convenient.

Please list contributions your team has made to RoboCup
https://arxiv.org/abs/1912.07405 https://arxiv.org/abs/1909.02385

Please list the scientific publications your team has made since the last application to RoboCup (or if not applicable in the last 2 years).
List of our publications can be found here: https://www.ais.uni-bonn.de/publications.html

Please list the approaches, hardware designs, or code your team is using which were developed by other teams.
None.

What operating system is running on your robot and which middleware are you using (for example Ubuntu 22.04 and ROS2 Galactic)?
Ubuntu 18.04 and ROS Kinetic.

Is there anything else you would like to share that did not fit to the previous questions?