
RoboCup 2023 Submission Survey

Survey response 1

Software

Team Name
Sweaty
Is your software fully or partially OpenSource. If so, where can it be found:
No.
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 used export from our CAD model, which was created based on the real robot.
Are you using Inverse Kinematics? If so what solution (analytic, (pseudo)inverse jacobian, etc...) are you using?
Yes. We use the inverse Jacobian.
Are you simulating your robot? If so what are you using simulation for?
Yes. Webots.
What approach are you using to generate the robot walking motion?
We use a two stage software approach. The target is calculated by a 3D-Simulation program based on Java. Afterwards a ROS based system (walk engine) using so called motion patterns is used. This program chooses motion primitives based on the intended movement. An addition overlay control loop is used for gait stabilization.
What approach are you using to generate motions for standing up?
We have motion primitives to stand up.
What approach are you using to generate kicking motions?
As other pre-defined motions this is dealt with by the walk engine module based on pre calculated motion primitives in combination with gat control.
Do you use any other motions than the previously mentioned? If so, what approaches are you using to generate them?
No.
Which datasets are you using in your research? If you are using your own datasets, are they public?
We use our own data sets for the vision based deep neural networks. They are not public.
What approaches are you using in your robot's visual perception?
Our vision is based on deep neural networks. The design is of our own and used for several seasons, based on U-Net structures.
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?
We plan in Cartesian space. The transformation is based on ray casting.
How is your robot localizing?
We are calculating intersections of rays based on the transformation from pixel to real world.
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 a path for navigation including obstacle avoidance. The algorithm is based upon the 3D simulation league software of team MAGMA.
How is the behavior of your robot's structured (e.g. Behavior Trees)? What additional approaches are you using?
We are using an internal state machine.

Do you have some form of active vision (i.e. moving the robots camera based on information known about the world)?
No.

Do you apply some form of filtering on the detected objects (e. g. Kalman filter for ball position)?
No.

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 are currently working upon our communication strategy. So far, we weren't able to get both robots running with our communication.

Please list contributions your team has made to RoboCup
Participation and place:
2014: 5th; 2016: 2nd; 2017: 2nd; 2018: 2nd; 2019: 2nd; 2021: (virtual) 1st

Please list the scientific publications your team has made since the last application to RoboCup (or if not applicable in the last 2 years).
- Klaus Dorer, Maximilian Giessler, Ulrich Hochberg, Manuel Scharffenberg, Rico Schillings, Fabian Schneckeburger, Humanoid Adult Size Champion 2021 Sweaty, RoboCup 2021, Pages 352–359 https://doi.org/10.1007/978-3-030-98682-7_29
- Maximilian Giessler, et al., Heel and Toe Contact Detection and Zero-Moment-Point Calculations to Transfer Gait Patterns from Orthesis Data to a Humanoid Robot, Walking on a Slope, IROS 2020

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 20.04
Middleware ROS2 Galactic

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

If you have a description document of your software you would like to share, you may do so here.

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