Software Survey 2026

Team name

Rhoban

Which division(s) are you applying for? If your used software differs between divisions, please fill out the survey once per division.

Middle Size (height < 125 cm, weight < 25 kg)

Is your software fully or partially OpenSource? If so, where can it be found?

We have partial software contributions that are open-source and can be found on our GitHub https://github.com/rhoban/ repositories

Are you using any software developed by other teams? If so, list every component that you are reusing and the team that originally developed it.

Not currently

Are you using any datasets in your research? If you are using your own datasets, are they public?

Only custom datasets that are not public yet, but we are open to it

Please list the scientific publications your team has made since the last application to RoboCup (or if not applicable in the last 2 years).

1. Marc Duclusaud, Grégoire Passault, Vincent Padois, and Olivier Ly. Extended friction models for the physics simulation of servo actuators, 2024.
2. Clément Gaspard, Marc Duclusaud, Grégoire Passault, Mélodie Daniel, and Olivier Ly. Frasa: An end-to-end reinforcement learning agent for fall recovery and stand up of humanoid robots, 2024.
3. Clément Gaspard, Grégoire Passault, Mélodie Daniel, and Olivier Ly. Footstep-net: an efficient actor-critic method for fast on-line bipedal footstep planning and forecasting, 2024.
4. Marc Duclusaud, Grégoire Passault, Vincent Padois, Olivier Ly, PlaCo: a QP-based robot planning and control framework, 2025

Are there any other contributions you would like to share with the RoboCup community?

Which approach are you using to generate the robot walking motion?

End-to-end reinforcement learning

Which approach are you using to generate other motions of the robot (e.g. kicking, standing up)?

Standing-up: End-to-end reinforcement learning

Kick was achieved with splines, but we also intend to use End-to-end reinforcement learning

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

Yes. We formerly used our own CAD and own tool to produce the full model:
https://github.com/Rhoban/onshape-to-robot/

We intend to switch to commercial robot this year (Booster K1). They provide a model.

What approaches are you using in your robot's visual perception?

YoloV8

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 everything in cartesian space. We have intrinsics camera calibration and use the robot kinematics for extrinsics pose estimation. Transformations are made using classical pinhole model, and line/plane intersections.

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

We do, but it is still hand-tuned.

What approach are you using to localize your robot?

We detect features on the field and run a custom particle filter

Is your team performing team communication? Which communication protocol are you using?

Robots communicate using a custom communication protocol (protobuf messages over UDP)

What approach are you using for navigation? Are you avoiding obstacles?

We use simple A* for global path finding and Footstepnet to plan footsteps locally

How is the behavior of your robots structured? (e.g. Behaviour Trees)

We mostly use state machines, some dynamic programming is used for strategy, which is not really advanced

Are you simulating your robot? If so, which simulator are you using and for what purpose do you use simulations?

We use more and more MuJoCo for simulation, mostly to check for dynamical behaviour before testing them on the robot

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

We are based on Ubuntu 22.04. We started using Booster K1 recently which is based on custom middleware, although exposing a ROS2 interface.

Is there anything else you would like to share that did not fit any previous question?