Software Survey 2026

Team name

Bold Hearts

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

Small Size (height < 110 cm, weight < 15 kg)

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

The software is mostly open source, and can be found at: https://gitlab.com/boldhearts

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.

We use the IKWalk open loop walk engine from Rhoban: https://github.com/Rhoban/IKWalk

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

Visual datasets that we have collected or abstracted from videos in the public domain. The collection of this data is not public.

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

Figueiredo, et al. "Footstep Planning using Sensitivity-based Empowerment for Humanoid Robots", RoboCup 2025: Robot World Cup XXVIII, 2025.

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

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

We base our walk on top of the IKWalk Engine and apply additional corrections to increase stability.

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

Manually generated motion scripts.

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)?

Our kinematic model is created via both CAD and physical measurements.

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

A lightweight YOLO-based CNN.

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?

Forward kinematics through the feet to the camera.

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

No.

What approach are you using to localize your robot?

High-confidence agents state which half of the field the ball is in, and this is used to break the symmetry.

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

We previously used mitecom. For "RobocupProtocol", we have had issues compiling protobuf on our platform and development machines.

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

This code is currently deactivated due to reliability.

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

Behaviour tree.

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

We have simulations for Gazebo, Webots and MuJoCo. We simulate for behaviour and motion.

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

Ubuntu 24.04 and ROS2 humble.

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

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