

# 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.**

Middle Size (height < 125 cm, weight < 25 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?**

-

**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?**

-