Software Survey 2026

Team name

I-Kid

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?

partially, https://github.com/BronWang/ikid_ws/tree/ikid_ws_ros_control

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.

NO

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

Yes，we created pictures of playground and balls, they are 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).

A precise and robust object detection method for humanoid soccer robot
Proceedings of SPIE - The International Society for Optical Engineering, Volume 13720,
November 17, 2025

Design of monocular vision field-assisted positioning for A Kid-sized humanoid soccer robot
Proceedings of SPIE - The International Society for Optical Engineering, Volume 13184, 2024

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

No

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

Reinforcement learning.

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

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)?

We export the dynamic model of robot designed with SolidWorks.

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

We use YOLO v8 to detect the football, robots, goal post and the corner points in the field.

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 perform planning in the Cartesian space.We transform objects from Image space to Cartesian space by projecting pixel coordinates into 3D rays using the Pinhole Camera Model, and then transforming these rays into the World Frame using the Forward Kinematics of the robot. Finally, we compute the intersection of these rays with the Ground Plane to get the specific Cartesian coordinates.

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

Based on an understanding of the environment and the requirements of the current task, the camera's orientation and scanning strategy are intelligently adjusted to improve the efficiency and accuracy of visual perception.

What approach are you using to localize your robot?

We first use yolo to identify corner points, and then obtain the position information of corner points, and make map matching to estimate our position on the court. Then particle filter is used to fuse the visual odometer information obtained by binocular

camera and output the position.

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

Yes, we perform team communication. We use UDP broadcast for teammate communication.

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

We utilize an Artificial Potential Field (APF) method for navigation. The target (e.g., the ball or a strategic position) acts as an attractive force, while detected obstacles generate repulsive forces to steer the robot away. Yes, we actively avoid obstacles.

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

State Machine.

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

Yes, we use Webots for simulation. We use it to validate our Particle Filter algorithms,and import our robot's URDF model to ensure kinematic accuracy before deploying to real hardware.

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

Ubuntu 22.04 and ROS2 Galactic

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

No