Software Survey 2026

Team name

Future Becoming

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

Large Size (height < 190 cm, weight < 80 kg)

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

https://github.com/loongOpen/Unity-RL-Playground

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?

No

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

No

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 and imitation 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 primarily use URDF models for kinematics and dynamics, which I import into Isaac Sim for training.

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

Yolo v8n

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?

I primarily train in image space with an end-to-end policy, but use implicit coordinate transforms through camera calibration when Cartesian planning is required for soccer kicking tasks.

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

Yes, we implement an active vision strategy. The robot autonomously adjusts its camera pose through servo control based on real-time image data (e.g., estimated ball position), enabling behaviors such as "turning its head to search for the ball" to keep targets in view and optimize tracking accuracy.

What approach are you using to localize your robot?

We achieve real-time localization through visual odometry and enhance dynamic stability and positioning accuracy by fusing IMU data.

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

No

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

We utilize the built-in navigation system of the Unitree robot, which performs real-time

localization and dynamic path planning based on sensor data. The system includes active obstacle avoidance capabilities, enabling it to autonomously evade both static and dynamic obstacles while in motion.

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

We use a decision tree to construct the robot's behavior logic, driving task execution through layered conditional judgments. This framework is tightly integrated with the navigation system, enabling dynamic action selection based on real-time perception data and closed-loop control.

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

Yes, we use our self-developed "Gewu" simulation platform for robot simulation, which is built on Unity and the PhysX physics engine. The core purpose of the simulation is to efficiently train the robot's motion skill models, such as walking, running, and kicking. Through the virtual environment, we can safely validate and optimize algorithm performance before deploying to the physical robot.

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 and ROS2

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

No