

# Software Survey 2026

## Team name

DUT Future

## 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?

partially OpenSource

## 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.

Yes, our system incorporates software developed by other teams. In particular, the visual localization module and the walking control module are reused from software originally developed by a research team at Tsinghua University.

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

No,we don't use any datasets.

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

We haven't make any publication since the last application to RoboCup.

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

Currently, we do not have additional contributions to report. We look forward to contributing to the RoboCup community in the future.

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

We use a learning-based approach (reinforcement learning) to generate the robot walking

motion.

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

We use predefined motion sequences designed offline for actions such as kicking and standing up.

**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 do not use an explicit kinematic or dynamic model. Our control is mainly based on empirical tuning and feedback control.

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

We adopt a hybrid approach combining deep learning for object detection and classical vision methods for localization.

**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 directly in image space, using object positions in the camera image for decision making.

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

Yes. The robot actively moves its camera to search for and track important objects such as the ball and goals.

**What approach are you using to localize your robot?**

We use a vision-based localization approach based on field line and landmark detection combined with probabilistic filtering.

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

Yes, our team performs inter-robot communication. We use a UDP-based communication

protocol over Wi-Fi to exchange information such as ball position and robot states.

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

We use a model-based navigation approach in Cartesian space to move toward target positions. Obstacles such as other robots are detected and avoided during navigation.

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

FSM and Behaviour Trees.

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

We use a basic simulation environment mainly for testing and debugging control and behavior algorithms.

**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.

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

No additional information to add at this time.