Software Survey 2026

Team name

WHU United

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?

We will gradually make our software Opensouce on our github project pages.

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, all the implementations are from Opensource community or our earlier works.

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

Yes, we will use some of the Opensource datasets and our own data, and they will be partially released due to reseach purpose.

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

[1]. Wentao Lu, Yarong Luo, Chi Guo, et al. An Iterated Equivariant Filter and Its Application in Tightly Coupled SINS/GNSS Integrated Navigation[J]. IEEE Transactions on Instrumentation and Measurement, 2025, https://doi.org/10.1109/TIM.2025.3565028.
[2]. Liu Yang, Guo Chi*, Zhan Jiao, Wu Xiaoyu. SDS-SLAM: VSLAM Fusing Static and Dynamic Semantic Information for Driving Scenarios[J]. IEEE Transactions on Automation Science and Engineering, 2025, https://doi.org/10.1109/TASE.2025.3573739
[3]. Wu Yejun, Zhan Jiao, Guo Chi*, et al. SAMSnake: A generic contour-based instance segmentation network assisted by Efficient Segment Anything Model[J]. Neural Networks. 2025,189:107491, https://doi.org/10.1016/j.neunet.2025.107491
[4]. Yiyue Meng, Chi Guo*, Aolin Li, et al. Context-aware Graph Inference and Generative

Adversarial Imitation Learning for Object-goal Navigation in Unfamiliar Environment[J]. IEEE Robotics and Automation Letters, 10(4):3803-3810, 2025, https://doi.org/10.1109/LRA.2025.3546860.
[5]. Tao Anbo , Luo Yarong , Guo Chi ,et al. Equivariant Filter for Tightly Coupled LiDAR-Inertial Odometry[C]. // IEEE International Conference on Robotics & Automation□IRCA2025□,2025, https://arxiv.org/pdf/2409.06948□CAA-A□.

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?

mjlab and OpenTrack with end to end machine learning

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

beyondmimic and VLA models

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 get it from Unitree Robotics official released materials

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

CLIP, Yolo series object detection approaches, Vision-Language-Action models

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?

Image space

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?

we propose a state estimation framework based on multi-sensor fusion, integrating data from an Inertial Measurement Unit (IMU), legged kinematics odometry, and visual cameras. By employing robust estimation theories such as the Invariant Extended Kalman Filter (InEKF) , we achieve real-time computation of robot State and sensor biases.

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

Yes, we use RTP and HTTP protocols.

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

We will make the robot obey natural language navigation instructions

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

Behaviour Trees and End-to-End Learning

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

Yes, we use Issac Lab and Google Research Football for simulate the motion and decision making process of multi-robots.

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?