Blenders Football Club: Extended Abstract
RoboCup Humanoid KidSize Soccer 2025

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Abstract. This extended abstract outlines the lessons learned from the Blenders FC's participation in RoboCup 2024. In addition, it highlights the major challenges that the team has faced and is actively addressing in preparation for the upcoming competition. It also details the planned improvements and provides an update on the current implementation status of these changes.

Keywords: Humanoid · Soccer · RoboCup.

1 Lessons learned

Blenders F.C. is the humanoid soccer team of the Monterrey Institute of Technology, Campus Guadalajara, Mexico. The team had its first participation as the only Mexican team in the category in Eindhoven, The Netherlands, in July 2024. During this edition, the team had the opportunity to experience the environment of an international competition and faced several challenges. The most significant lessons learned included understanding the logistics of the competition, recognizing the importance of localization, and gaining insight into the state-of-the-art technologies and strategies employed by other competitors.

Additionally, the team identified several areas for improvement concerning hardware and resource requirements, including the need for additional batteries, more powerful chargers, Ethernet cables, and spare gears and actuators for damaged OP3 robots[1].

2 Major problems

The continuous learning and improvement for the team stems from the observation of problems during the 2024 competition.

As a small team, software development often does not progress as quickly or significantly as the team would hope. Given this, one of the tasks that lost priority was localization. During the competition, the importance became evident, as time was lost due to penalties, and a disadvantage emerged because the robots lacked a sense of direction on the field.

Another problem was the implementation of the game controller. The local testing with the game controller for the team had been successful, but whilst in the competition, the robots were unable to communicate back successfully to the game controller, which resulted in penalties.

3 Major changes

The team keeps on working and improving our algorithms, the first major change is the implementation of a YOLOv4 Tiny model [2] to identify soccer balls and goalposts. To lighten the load of the model on the CPU, an Intel Neural Compute Stick 2 [3] is used. This change has been completely implemented and the team is working on hardware design to include the neural stick without a risk of it falling over or being damaged if the robot falls.

Furthermore, changes like the implementation of localization for the robots is in progress by the time this application is submitted, but projects to be fully tested for the XVI Mexican Robotics Tournament, which will take place in May. Different strategies are being considered for this task, such as ORB-SLAM, VINS-Mono, and triangulation approaches.

Finally, some software architecture changes are being implemented and planned to be done by January, which will simplify version control and ensure consistency across algorithms on all the robots.

References

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