

Abstract—Blimp and ground robots have received much attention in the research due to their strong potential in the explorations tasks. There are many applications where a robot must explore an area without previous knowledge of the environment. This work presents a system composed by a blimp and ground robots that cooperates and share visual information to address those requirements. To realize this task, an efficient vision-based object detection and localization algorithm is proposed by using Speeded up Robust Features technique. A navigation system for ground robot was proposed supported by vision data from the blimp robot. These data are optimized by fuzzy sets model to correct the prediction position information of the ground robot and the obstacles in its pathway. Based on these data, a navigation and obstacle avoidance system is used to control the ground vehicle trajectory. The overall system has been tested in actual missions, and results show that the system has good results in navigation and it is effective, robust and suitable for complex tasks.