

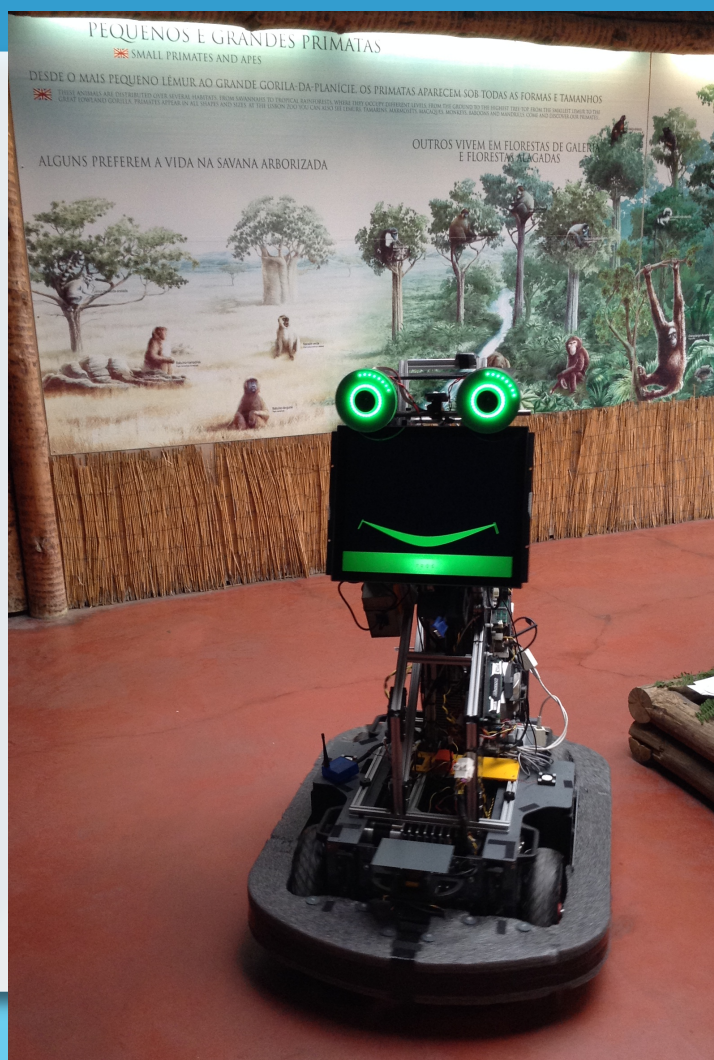
FROG: Fun Robotic Outdoor Guide

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ABSTRACT: The EU 7th Framework project FROG aims to develop a guiding robot with a winning personality and behaviors that will engage tourists in a fun exploration of outdoor attractions. A number of technologies are required to achieve the objectives of the project, including social navigation, human awareness, affective computing, augmented reality and the development of an engaging robot personality.

The FROG robot

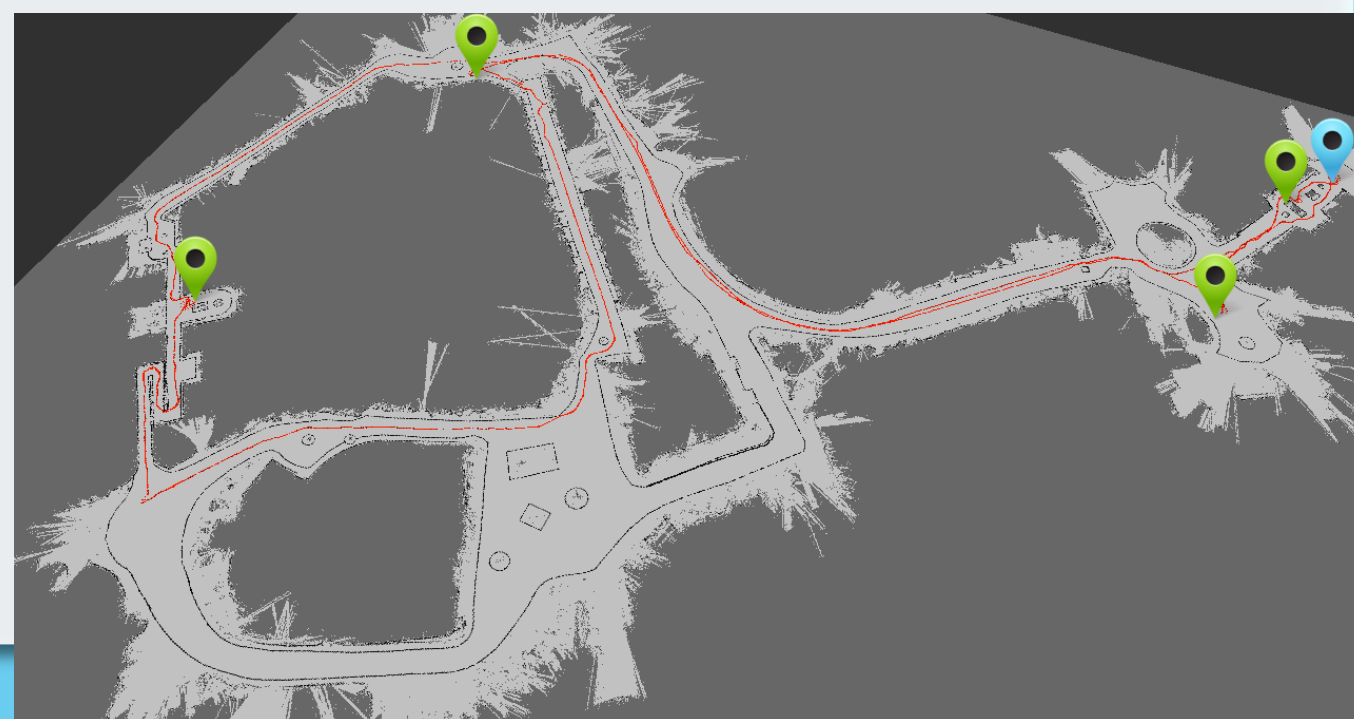
IDMind has developed the FROG robot. It consists of a skid steer robot platform, ready for outdoor scenarios. It has also interaction elements, like displays, leds on the eyes and a short pointing device.



Safe and social navigation

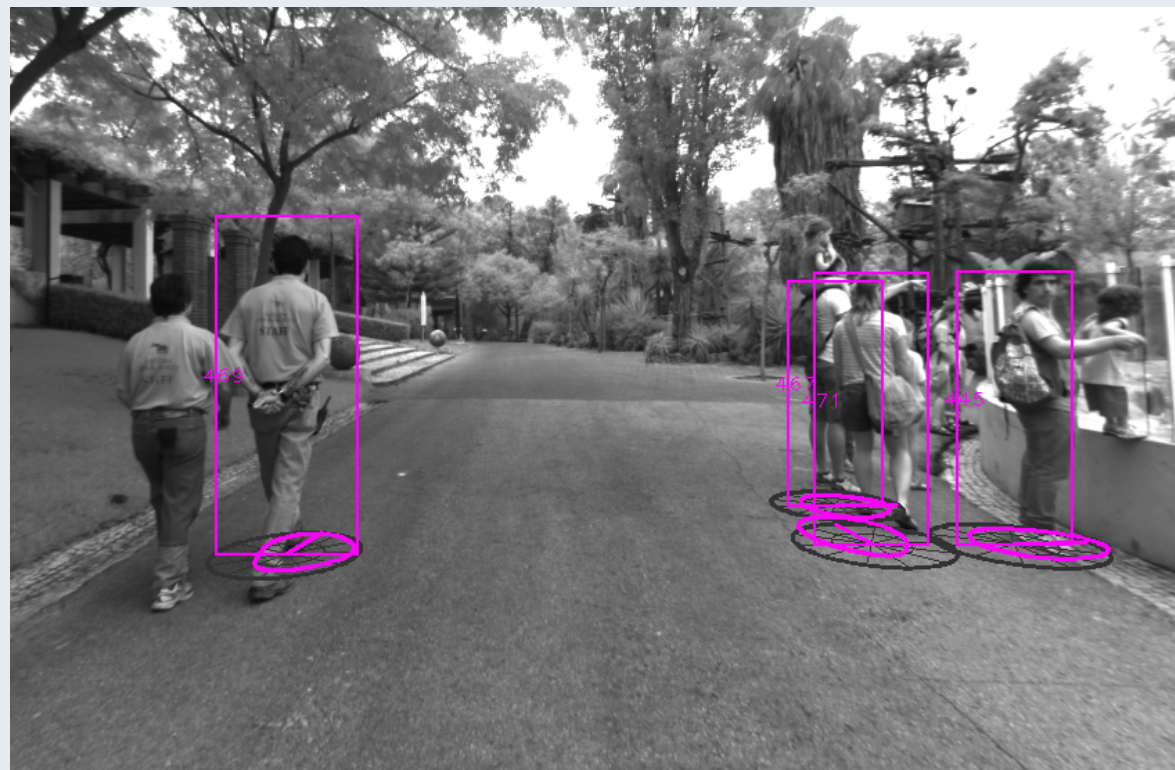
The team of the Robotics, Vision and Control Group at UPO are working on the navigation stack. The main issues are:

- Robust and accurate localization for navigation and Augmented Reality outdoors scenarios.
- Robust and human-aware navigation in outdoor and crowded scenarios



Human awareness

UvA has developed a pedestrian detection and pose estimation algorithm using stereo vision.



This module allows FROG to determine the persons positions and orientations, and will be used for human awareness within the navigation stack.

Affective Computing

ICL is developing algorithms for affective computing. These methods will provide FROG with ways of adapting its behaviors to the users' states

The module will provide as affective cues:

- Valence: how positive or negative the emotion is.
- Arousal: how excited or apathetic the emotion is.



Scenarios

A robot will be developed to guide visitors through outdoor touristic sites. The robot will be tested in two places; the Lisbon City Zoo (Lisbon, Portugal) and the Royal Alcazar (Seville, Spain).

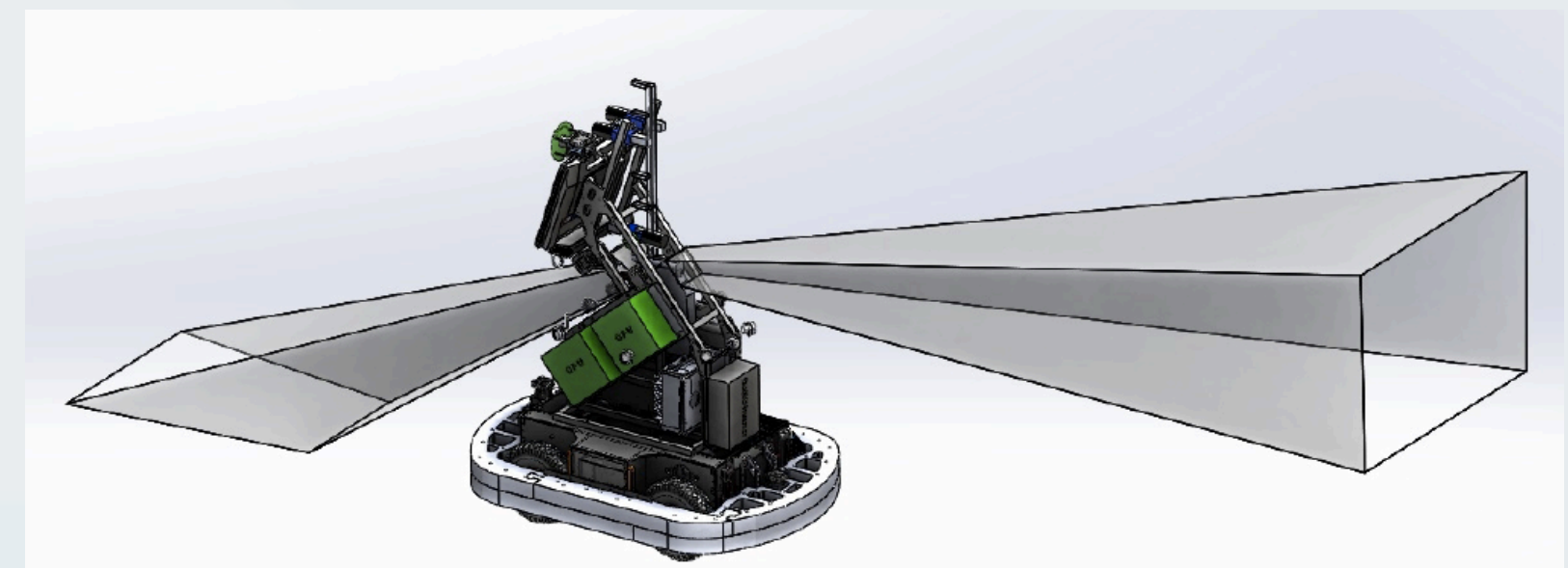


Ad Utrunque "Be prepared for everything"

The final demonstration of the FROG-project will be in the Royal Alcazar in Seville, where the robot is expected to operate for two weeks.

Augmented Reality

One very interesting interaction component of the FROG robot is an Augmented Reality engine. YDreams is developing the corresponding module. The robot is able to point and talk about Points of Interest.



The AR component works without requiring GPS coordinates or AR markers, funded on the position obtained by the localization algorithms



Robot personality

UT is studying the adequate robot behavior and personality to obtain a smooth and satisfying interaction between the robot and the visitors of the sites. A fun and convincing personality next to effective behavior is important to make the robot guide visitors in an engaging way.

Results

In the second-year demo, the robot has guided visitors around in the Lisbon City Zoo, showing the animals, and telling about the species, their normal behavior and the natural environment.



The demo involved a route of 750 m. meters, with different points of interest, and it lasted 45 minutes. The demo week the robot was navigating autonomously for more than 3 kms.