

Team Information

FIRST DRAFT



Picture of vehicle:

Name of vehicle: LINCE

Picture of team leader:



Name of team leader: José Miguel Almeida
Team Name: LSA/ISEP
Team E-mail: lsa@lsa.issep.ipp.pt
Website: www.lsa.issep.ipp.pt
Location: Porto, Portugal
Institution/Company: Autonomous Systems Laboratory, Institute Superior of Engineering of Oporto.
Address: Rua Dr. António Bernardino de Almeida, 431

Team Information

4200 - 462 Porto

Telephone: +351220340500

Fax: +351228321159

Team Description:

The Autonomous Systems Laboratory (LSA) is a research unit from the Porto Engineering Institute (ISEP), a school of the Porto Polytechnic Institute (IPP). Created in 2001, it has 13 permanent researchers, and integrates in its various research projects more than 20 students each year from IPP and external academic institutions, in various stages of education and different areas of knowledge.

The laboratory mission is the research and development of science and technology in autonomous systems engineering and its dissemination. The research ranges from: distributed control, navigation and coordination; embedded real-time systems design; and advanced sensing and perception. Those topics are applied to field robotics, oceanographic and environmental monitoring, security and transportation.

Researchers at LSA have been involved in the last 14 years in the areas of field robotics and autonomous systems, and have designed and developed several field robotics systems like: unmanned air vehicles (UAV) for forest management, ocean and coastal monitoring (FALCOS UAV); multi-purpose autonomous surface vehicles (ASV), *ROAZ and ROAZ II*; Remotely Operated Vehicles (ROV) for the inspection of underwater structures; Unmanned Ground vehicles (UGV), LINCÉ, Runner, and the ISePorto robotic soccer team (Robocup MSL).

The lab know-how focuses in field robotics: on the design and implementation of autonomous robotic systems (marine, aerial and terrestrial), navigation algorithms, sensors and solutions, in robot control and multiple robot coordination and decision, artificial computer vision and specific hardware design. In addition we have know-how in developing Linux based embedded robot control software and, strong and extensive field robot missions experience.

In addition the lab has a strong microelectronics and digital circuit embedded design experience with the development of various components for autonomous systems integration, namely: embedded smart vision sensor (reconfigurable hardware and IP core based design); custom designed inertial navigation system; highly integrated and network based motion control board; custom designed triple GPS navigation system for attitude determination; various embedded computational boards.

The LSA plans to bring to ELROB a team of vehicles with some cooperative capabilities. Two LINCÉs vehicles (Land Intelligent Cooperative Explorer), a small electric all terrain vehicles equipped GPS, INS, Video cameras, thermal camera, a CAN bus for interfacing motor controllers boards and some sensors, an embedded CPU with Linux and running custom mission, control and navigation software. One or two UAVs, drone like, equipped with GPS, INS, custom autopilot, a CPU for vision processing, mission management and communications, a wireless

Team Information

adapter, and a thermal or video camera. Currently are instrumenting two electrical medium size all terrain vehicle, that should be functional for this event. The users interface run in portable rack console with sunlight monitor, embedded computer, and communications devices.

Sponsors: ISEP – www.isep.ipp.pt
IPP – www.ipp.pt
Other to be defined

Selection of scenario:

1. Reconnaissance and surveillance _X_
2. Camp security _X_
3. Transport _?_
4. Mule _X_
5. EOD _?_

Team Information

Proof of citizenship: A copy of team leader passport will do (will not be published)!