



## **RoboCup Federation Call for Tenders: A Standard Robot Platform for Robot Soccer**

RoboCup is an international joint project to promote Artificial Intelligence, Robotics and related fields. It is an attempt to foster AI and intelligent robotics research by providing a standard problem where a wide range of technologies can be integrated and examined. RoboCup chose to use the game of soccer as a central topic of research, aiming at innovations to be applied for socially significant problems and industries.

The RoboCup competition includes leagues of different kinds of robots. Teams in the four-legged robot league use a standard robotic platform. The difference between the teams is in the game-playing software that they devise. The current platform is Sony's Aibo entertainment robot. The RoboCup Federation is seeking expressions of interest for a new platform to succeed the Aibo. The characteristics being sought are:

- A standard platform
  - No hardware development should be required of the teams. Indeed, no hardware modifications should be allowed.
  - The robot must have an operating system and software development environment allowing full control of sensors and actuators.
  - The platform should be modular, permitting upgrades and modifications from year to year.
- Many degrees of freedom
  - Quadruped robots allow for a large variety of gaits and kicks. The new platform need not be a quadruped but it should have a sufficient number of degrees of freedom that teams can create interesting new behaviours and modes of locomotion.
- Directed Perception
  - The robot is required to have onboard colour vision but not an omni-directional camera since we wish teams to develop methods for active perception.
- Full Autonomy
  - The robots are required to be fully autonomous. That is, they must have on-board computing resources sufficient to meet all processing requirements. No off-board computation is allowed.
  - The robots must operate with no intervention by team members and minimal intervention by referees.
  - Games typically consist of two half parts, each of them lasting for around 15mn, with a 10mn break. Onboard battery power must ensure that the

robots require no recharge during each of those periods, and recharging should be as fast as possible.

- Wireless Communication
  - The robots must be capable of wireless 802.11 communications permitting the exchange of information between robots on the field.
- Physical characteristics
  - Ideally, the robot should be relatively small such that several can fit comfortably on one of the current RoboCup fields.
  - Robots that are visually appealing will be looked upon favourably.
- (optional) Compatibility with some available robot development software (e.g., Pyro, MS Robotics Studio software, Player/Stage, Teambots, Webots, or other, please mention)

Sales and support must be worldwide. There are approximately 40 teams in the current four-legged robot league from North and South America, Europe, Asia and Australia. As the game rules typically require each team to play with 4-5 robots, the selected platform has a great potential for a considerable number of sales. The tender should show evidence of the supplier's capacity to respond in a timely manner to a potentially large number of units for sale upon acceptance of their bid and of its capacity to respond in a timely and cost-effective (to the customer) manner to requests for service (hardware repairs and technical support). **The suppliers should also include in their proposal an estimate of the robot's cost to RoboCup teams.**

It is intended that a demonstration of the robot will be presented for consideration at RoboCup 2007 in Atlanta, USA (<http://www.robocup-us.org/>) with the selected platform being introduced into the RoboCup competition in 2008.

The intended schedule is as follows:

1. Nov 13, 2006: Call for Tenders
2. Dec 31, 2006: Deadline for tenders to submit a proposal to the RoboCup Federation (RCF), by sending an email to [office@robocup.org](mailto:office@robocup.org).
3. Jan 15, 2007: Announcement of short list of selected tenders
4. July 1-10, 2007: Platform demonstration at RoboCup2007, Atlanta, by the selected Tenders, followed by a decision by RCF on the selected platform

Information about RoboCup can be found at <http://www.robocup.org>. For further information about the tender, please contact Pedro Lima [pal@isr.ist.utl.pt](mailto:pal@isr.ist.utl.pt).