



World Robot Summit Call for Tenders: A Standard Robot Platform for Partner Robot Challenge

The Japanese Ministry of Economy, Trade and Industry (METI) and the New Energy and Industrial Technology Development Organization (NEDO) will hold the World Robot Summit (WRS) in 2020 that consists of a robot competition and a robot exhibition. WRS aims to bring together the most advanced robot technologies from all over the world and overcome the limits to solve challenges that arise; deepen people's understanding of robots; and induce positive discussions that would lead to concrete uses and applications of robots. WRS will feature two events: 1) World Robot Challenge (WRC), in which robots compete with one another and 2) World Robot Expo (WRE), where the latest robotic technologies will be exhibited. A total of 7 challenges under 4 categories (Industrial Robotics, Service Robotics, Disaster Robotics and Junior) are planned to be held.

In the Partner Robot Challenge under the Service Robotics Category of the WRC, robots will cooperate with humans in dealing with various chores that come up in a dynamic household environment, such as tidying up rooms and house-sitting. In this Challenge, all teams will be required to use a standard robot platform specified by WRS.

The WRS hereby announces a call for tenders to develop and distribute a new standard robot platform for the Partner Robot Challenge. One platform will be chosen after careful consideration.

The following sections describe the functionalities and other desired features of the Partner Robot Challenge as well as the call schedule and the contact.

Additional information, including a Q&A, will be provided during the call at <http://www.robotcompetition.org>

1. Functionalities

The standard platform is expected to be used for developing applications integrating the following functionalities. New functionalities not yet addressed are also welcome

- Full autonomy: on-board sensing and computation must be sufficient to execute the desired tasks. A configuration that allows for an additional external laptop to be used to increase on-board computation is also acceptable.
- Navigation capabilities to move in the environment approximately at the same speed of a person, also for relatively long paths.
- Ability to move in an indoor environment where small gaps (e.g., spaces between door, small gaps at the entrance of an elevator, etc.) may be present, not excluding the possibility of addressing more complex mobility challenges (e.g., stairs).
- Ability to manipulate (e.g., pick and place) small objects (5 to 20 cm) normally found in a house, in a shop, etc. (e.g., glasses, small bottles, cans, cereal boxes, books, etc.)
- Ability to grasp objects on tables and possibly at other heights, high or low.
- Enough visual and depth field of view to see a person around the robot and to see possible obstacles on the ground.
- Ability to interact with humans in a natural way using speech (through on-board frontal microphone(s) and speakers), gesture (through on-board cameras and robot arm) and GUI (through an on-board touch-screen).

2. Software

Feature	Minimum Requirements	Optional
SDK	Full programming of the robot; Full access to the sensor data; Open source; Middleware (ROS, RTM...)	Basic functions (e.g. localization and navigation); Compatibility with PCL and MoveIt
SDK Documentation and Support	Full documentation in English; Website for support; Q&A	Organization of workshops to teach and demonstrate how to use the platform
Simulator	Simulator support	

3. Hardware

- No hardware specifications are given, since we are open to many possible solutions.
- Creative and innovative solutions are strongly preferred.
- The robot design is one of the important selection criteria for this call and the robot should have a friendly and/or attractive appearance.
- The appearance must be politically correct and acceptable by any society. It should be designed for users with diverse backgrounds including gender, age, and physical capabilities.

4. Price

- Price is an important selection criterion.
- The platform must be affordable for university research groups and must be usable (with minimal revisions) for at least 4 years. Expected maximum price should be around 50,000USD.
- Expected yearly cost of service and maintenance should be described in the proposal.
- The platform must be modular so that upgrades can be done with minimal effort and cost.

5. Availability and support

- Robots should be available for about 24 teams (negotiable) in the first year (2017) and 24 teams for following years (2018 onwards).
- WRS is an international event and teams from around the world are expected to participate.

6. Transportation

- The robot should be easily packed in one or more special cases that can be transported easily by land, air, or sea.

7. Schedule

February 28, 2017	Deadline for submission of proposals
March 15, 2017	Final decision by WRC
2017	Trial Competition
October 2018	World Robot Summit 2018 (Preparatory Summit)
2019	Trial Competition (Tentative)
October 2020	World Robot Summit 2020

8. Submission of proposals

Interested companies and organizations are invited to submit a full proposal in English containing detailed technical specifications of the proposed platform. Multiple options (optional parts or features) are also welcome to be addressed in the proposal. In addition, the proposal should include the following details:

- Company profile;
- Price of the platform for Partner Robot Challenge teams;
- Price of optional parts (upgrades) and maintenance (including warranty);
- Production and delivery schedule;
- Status of worldwide support for teams;
- Support at competitions;
- Company's interest in becoming a global sponsor of WRS; and
- Any other information that can be useful for the evaluation of the proposal.

Proposals must be submitted as a single PDF document and may optionally contain links (i.e., URL) to additional material (e.g., photos, videos) showing some capabilities or features of the proposed platform.

Proposals must be sent to the following e-mail address with a subject line that contains [PRC-SP]:

h.okada@tamagawa.ac.jp

The deadline is February 28, 2017.

To avoid possible problems with mail servers, the following procedure is suggested:

1. Send a first e-mail with only text (no attachments and no URLs)
2. Second a second e-mail with attachment and URLs.

A confirmation e-mail will be sent upon receipt of the proposal.

9. Contact

Service Robotics Competition Committee is available to provide additional information at any time during the call period at h.okada@tamagawa.ac.jp.



A Standard Robot Platform for Partner Robot Challenge

Evaluation Sheet

Company/Organization: _____ Country: _____

Model/Type of robot: _____

Category	Parameters
Functionalities	<p>The robot has:</p> <ul style="list-style-type: none"> • autonomy • navigation capabilities to move in the environment approximately at the same speed of a person also for relatively long paths. • the ability to move in an indoor environment with small gaps may be present. • the manipulation capability of small objects typically found in a house. • the capability to grasp objects on table/desks and at other heights. • enough visual and depth field of view to see a person around the robot and to see possible obstacles on the ground. • the ability to interact with humans in a natural way using speech, gesture and GUI.
Software	<p>The company/organization will provide:</p> <ul style="list-style-type: none"> • SDKs • SDK documents in English • Simulator support
Hardware	<ul style="list-style-type: none"> • The weight and size of the robot are appropriate for use at home. • The appearance is politically correct and acceptable in our daily lives.
Price	<ul style="list-style-type: none"> • The platform is affordable for university research groups and is usable (with minimal revisions) for at least 4 years.

Availability and Support	<ul style="list-style-type: none"> • Enough number of robots offered. • Worldwide support for teams is provided.
Transportation	<ul style="list-style-type: none"> • The robot can be easily packed and transported easily by land, air, or sea.
Additions	<ul style="list-style-type: none"> • Interest in becoming global sponsor of WRS is shown. • Other (specify):
Deductions	<ul style="list-style-type: none"> • (Specify if any)