Project Details

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- www.iward.eu

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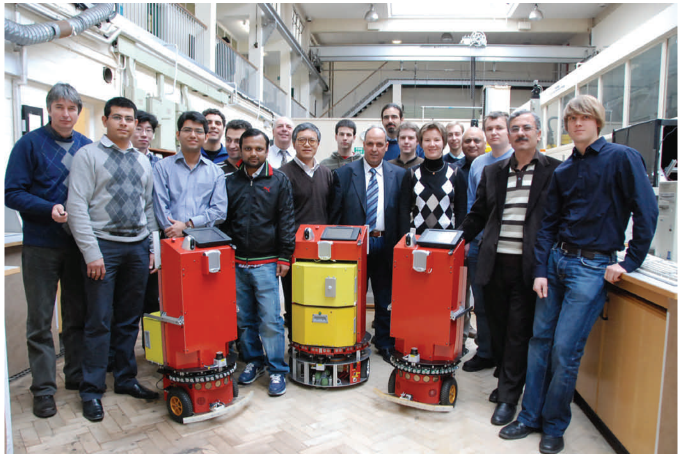
iWARD

Intelligent Robot Swarm for Attendance, Recognition, Cleaning and Delivery



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Objectives

IWARD project is a European research project aiming to develop a team of service robots for hospital environment that unburdens hospital staff from time-consuming routine jobs. Cooperative IWARD robots are able to perform specific tasks based on the actual configuration of each robot. A modular design forms the basis for adding/removing modules with task-related functionality to the robots. Human-robot interaction is provided by different ways: via computer terminal, PDA, touch screen or speech, generating a unique user interface. Requests addressed to the IWARD robot team are negotiated and executed by the self-organising robots.

IWARD Robot Team

IWARD robot team comprises three robots - two of them are based on a Pioneer 3-DX platform and one purpose-built robot (on the left).

All robots have several drawers for adding modules which shape the robots‘ body.

IWARD Missions

The following missions can be performed by IWARD robots: delivery, cleaning, guidance, video conferencing and patrolling. Obstacle avoidance is based on ultrasonic sensor and laser. Additionally, the robots are able to detect emergencies.

IWARD - Delivery

Ordering medicine from the pharmacy is a regular procedure in hospitals. IWARD robots can get equipped with a lockable delivery box for transporting needed customary medicine from the pharmacy to the nurses' place. Authorisation is needed for placing and removing medicines in/from the delivery box.

IWARD - Cleaning

Keeping hygienic standards is of high importance in hospital environment. Hence, IWARD robots can be also equipped with a cleaning unit supporting two different kinds of cleaning. Regular cleaning follows a predefined time schedule whereas the so-called spillage-cleaning is used when small areas are identified that need to be promptly cleaned.

IWARD - Guidance

Especially in large hospital complexes, guiding of patients to the locations where their checkups take place is beneficial. A robot equipped for guidance is instructed by an authorised person to lead the patient to a known position by using a speed appropriate for the patient. At the final destination another nurse will await the patient.

IWARD Missions 2

IWARD - Video conferencing system

Doctors might not be able to have instant physical visits with all of their patients. That is why IWARD system provides a possibility to initiate virtual consultations between doctor and patient in order to communicate remotely with each other. On both sides, a robot will take over the role of transmitting sound and vision. Alternatively, the doctor might use his/her computer terminal for that purpose instead of having a robot on-site.

IWARD - Patrolling

At night, IWARD robots can be used for patrolling along predefined routes. In this way, they can contribute to monitoring the activities of specific locations. Unexpected happenings are recorded and security personnel is immediately informed.

IWARD - Emergency detection

IWARD robots continuously check their environment for persons that might have been fallen and require immediate help. In case of a person is detected as lying on the floor, responsible hospital staff is notified about the emergency. A snapshot of the robot's perspective is provided as well.

Implications to the End-User

IWARD will provide maximum protection of hospital end-users' interests including technical solutions to provide data security. Direct physical contact between robot and humans is restricted to user interface operations. User requirements have already been developed based on results of interviews done with hospital staff. As a second step, evaluation of IWARD system is planned in factitious hospital environment with involvement of potential end-users towards the end of the project's runtime. Provided that fully functional robots have been approved while testing in laboratory environment, there might be test applications in hospital, too. While operating robots will always be accompanied by researchers.