Multi agent software with elements of artificial intelligence

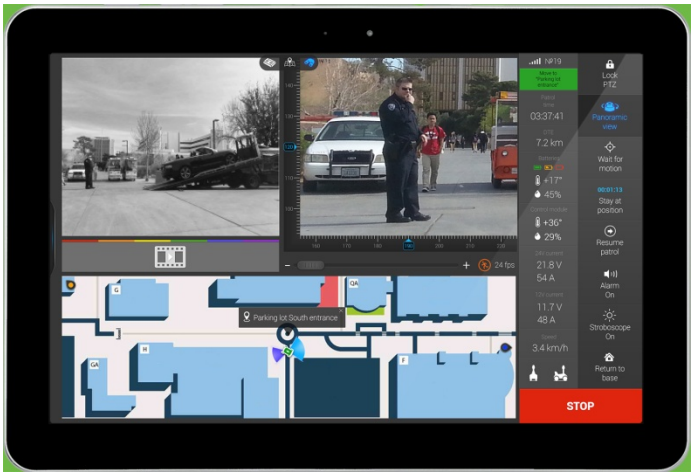
Robots supplied with tablet computer with preinstalled special software “mobile robot Rover Agent System”. This is a client software of multi-agent system. Software provides a display of terrain map showing the current location of the mobile robot on it displays the actions performed by the robot and the condition of its systems: Battery power, link capacity, temperature, power reserve.

The software has an intuitive interface and does not require special knowledge and skills from the user. If it is necessary, to the application interface could be added control screens for additional transportable equipment. In particular, for the protection of the robot the operator interface screens could provide additional online video and ability to work with video archives. When used together, to the software of robot could provide UAV (drone) management screen with control interface of takeoff and landing UAV (drone).

To solve the problems associated with the work on large areas and involves the use of a large number of robots, the company continue to improve special software with elements of artificial intelligence. Problems managing large groups of robots (intelligent agents) are very complex. Such problems usually do not have a complete algorithmic solution, due to incomplete knowledge of the environment, its unsteadiness, the presence of unpredictable events that lead to the failure of individual robots and other factors difficult to formalize practical cooperation group of robots to real environment.

At the same time, the solution control group of robots can more fully reveal the capabilities of mobile robotic systems to maximize the effectiveness of their use.

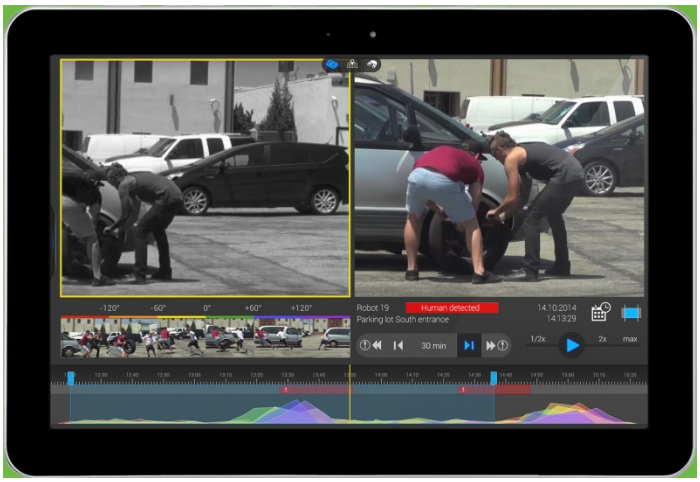
The software package «Patrol MAS» (Multi-agent system) designed for interaction in a group of mobile robots to solve complex problems in a non-deterministic dynamic environment. The approach for the successful solution of a nontrivial class of problems based on three components:



The first – the number of robots per unit in area should be sufficient, and possibly redundant as a direct solution to the problem, and support, for example, most of the robots used for security on predefined route, and those robots provides a small part of the exploration of new optimal transportation routes.

Second, – providing a continuous communications channel between neighboring robots or robots between any of the groups as a whole. Free circulation of information necessary for its continuous updating,

access for all bots to successful strategies for solving local problems, local dynamic reallocation of objectives.



Exchange of information between agents assumes its optimum structuring and formalized as with respect to the state of the robot, and in relation to the environment. A continuous exchange of information between intelligent agents suggests grouping of robots as a single super organism.

The third – the dynamic definition of specialized subtasks for each of the robots to successfully solve the problem for a group of robots in general. For example, hazmat robot, was the only link in the transmission of information to the robot performs a task scout (scout), in this case, hazmat robot must postpone the task of hazmat, despite the fact that it is a priority for the group as a whole, while ensuring link to perform reconnaissance tasks. Recombination of the objectives is possible under two conditions, redundancy, intelligent agents and their universality.

Computing and sensory capabilities of intelligent agents-robots cannot handle information about the environment in general, so each of the robots has a fragment of knowledge. However, this group of robots in general has full reliable information on the environment and robots as the integral component of it. Tasks that can solve the grouping of robots having such a swarm intelligence (swarm intelligence) greatly exceed the capabilities of individual robots, multiplied by the number – it's a great demonstration of the case where the number creates a new quality.