Unmanned Ground Video Surveillance Vehicle
HAZARDOUS MATERIALS DETECTION SYSTEMS

VIDEO SURVEILLANCE

Security Robot

SMP Robotics develops and provides light unmanned ground vehicles UGV designed for all-season driving in designated areas. Rover S5 performs multiple trips over mapped routes,_unattended. Its autonomous motion control and navigation system is guided by machine vision, performing pinpoint video data analysis, which allows the vehicle to select and navigate routes, avoid obstacles, stay on course and repeat the job cycle multiple times.

Technology

SMP Robotics has developed a UGV guidance system for on-and off-road jobs. This autonomous navigation control system performs great even under conditions of interrupted satellite transmission, assuring the route integrity. Best suited to perform over a repeating route (closed-loop circuit), its accuracy increases with each trip. A particular advantage of this innovative UGV navigation control technology is consistent performance in all kinds of challenging conditions.

All our UGV robots are equipped with our proprietary navigation control system, a computer vision network comprised of three video devices, each designed to perform a specific integrated function.

The first system includes Stereo Vision Camera that detects obstacles and allows the robot to correct the course. Stereo Vision Camera creates real-time 3D disparity map, which builds a dynamic 3D environment at a distance of several meters ahead of the vehicle.

The second system consists of single road detection camera that provides the exact path image for the autopilot and keeps the robot on the route.

The third system provides autonomous off-road navigation by using computer vision. It’s based on the visual odometry system for Simultaneous Localization and Mapping – SLAM.

The system employs embedded Real-Time Image Processing to adjust (filter) incoming data, using data received from the Inertial Measurement Unit (IMU). Autonomous navigation system enables the robot to determine its location on a digital map.

The security robot Rover S5 is based on unmanned ground vehicle chassis and is approaching a large-scale production. The robot is designed for outdoor patrolling and equipped with intelligent video surveillance system which automatically scans the secured premises. The robot stops at preset positions for optimal surveillance and inspects the area within 50 meters (164 ft) range to detect any moving objects.

When such objects are detected, the video surveillance system focuses its steerable PTZ camera on the object and transmits the video to the security post.

Today it looks unusual and is hard to believe.

Tomorrow it will become common.

The day after tomorrow people will ask –

“How have we lived without these robots before?”

AT SMP ROBOTICS THE FUTURE IS NOW!
SMP Robotics Systems Corp. is proud to present our new modification of the security robot, Rover S5 Hazmat, designed to operate in hazardous environments.

This autonomous robot is ideally suited for collection of information about air pollutants, temperature and radiation. In addition to the standard set of cameras, Rover S5 Hazmat robots are equipped with special gas analyzers, temperature sensors and radiation detectors, and may be additionally equipped with other devices per customer’s request.

ROVER:S5 HAZMAT IS ABLE TO PERFORM REMOTE INSPECTION TASKS AT THE INDUSTRIAL FACILITIES WITHOUT HAVING DIRECT ACCESS THE HAZARDOUS AREAS. ITS OPERATION DOES NOT REQUIRE HUMAN PRESENCE. Alarm systems are only triggered if some environmental parameters are outside of the normal range. The facility staff does not have to monitor the process all the time.

Our system provides not just the financial savings, but more importantly, relieves humans from repetitive routine tasks and improves execution of the wide range of inspection tasks.
Intruder Detection

The most exciting things happen when our robot detects an intruder. We call this behavior the Swarm Intelligence. Upon detection of an intruder the robot stops moving along its designated route and switches to the optimal path to the intruder.

The chosen route is not simply the quickest route to the goal; its purpose is to find locations where visibility (video pic-}

ARTIFICIAL INTELLIGENCE

The most important element of our system is its AI-enhanced software, at the heart of which is the Multi-Agent System MAS. Each robot uses set of sensors to receive information about the environment. By processing the data coming from all these sensors, the traffic control system solves the problem of building a motion pathway. The primary source of data for successful motion pathway solution is a vision system capable of creating a map of alternative pathways. The vision system corrects and improves the map with every repeated passage. In the event of obstacles, the system detours and thus explores the surrounding area. Thus, the GPS navigation system becomes secondary in choosing a route.

Multi-Agent System

Upon encountering obstacles along the way, the system automatically decides on the detour path selecting from a variety of possible ways. Naturally, every obstacle checked is this intruder or not. In the multi-agent system, all participating agents (robots and base servers) may access the information circulating in the system. Once one agent knows the information, it becomes available to every agent within the system. In fact, the ability of sharing information and executing group tasks is exactly what makes a group of our robots a Multi-Agent System.