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Search info

Search queries

Databases

- USPTO Bulk Datasets
- Semantic Scholar's Open Research Corpus

References Summary

Drone for detecting and removing mines

Oh September 07, 2021 KR102299872B1

Mine clearance drones with respect for the ecosystem and the population.

Moein June 10, 2022 FR3117204A1

Mine removal management system using drones and mine removal management method using the same

Unknown January 08, 2021 KR102200588B1

Method of detecting and removing mines using drone

Oh April 13, 2018 KR101832673B1

Marine crowding drone station

Sun et al. February 07, 2022 KR102356576B1

Arrangement for supplying drones of a drone swarm

Müller et al. May 12, 2022 WO2022096410A1

Method and system for removing foreign matter from solar panel surface by using drone swarm flight

Paik et al. December 30, 2021 WO2021261695A1

A smart city waste disposal system

Chong October 03, 2023 CN116835172A

Drones for detection and removal of landmines

Binghou March 08, 2022 CN114148512A

A kind of uav microwave mine clearing device

Unknown January 30, 2024 CN220418246U

Drone with ultra-high frequency unit for the detection and disposal of explosive devices and mines

Unknown November 08, 2023 UA154363U

A method and system for mine detection based on swarm intelligence

Ke et al. June 11, 2021 CN112946766A

A uav-based intelligent garbage collection system and recycling method

Hengjie et al. April 06, 2021 CN112607244A

Dynamic monitoring device for comprehensive mine management using unmanned aerial vehicle remote sensing technology

Mengling August 11, 2020 CN211223908U

Detection and removal of mines using drones

Oh March 14, 2019 WO2019050298A1

System for collecting garbage using a plurality of drones that can be interlocked

Unknown June 10, 2022 KR102408006B1

Hybrid mine detection drones equipped with explosive detection sensors and long-range metal detection sensors

Park May 13, 2019 KR101976483B1

Group intelligence-based land mine detection method and system

Unknown April 01, 2022 CN112946766B

Method of remote search and detection of explosive objects and mines

Unknown October 05, 2022 UA151975U

Method for determining the position of a land mine located in a search area

Schartel et al. December 06, 2018 DE102017112210A1

Drone for detecting and removing mines

Oh September 07, 2021 KR102299872B1

The present invention relates to a drone that detects and removes landmines buried on the ground or underground, and more particularly, consists of a detection drone that detects mines and a drone that removes the drone detected by the detection drone, and mine detection It is a mine detection and removal drone that can detect and remove landmines by placing them in dangerous areas where war can occur, such as military borders, by replacing the tasks dangerous for humans to perform directly by performing the removal and removal by drones.

Mine clearance drones with respect for the ecosystem and the population.

Moein Majid Moein June 10, 2022 FR3117204A1

Mine clearance drones with respect for the ecosystem and the population Device comprising a mine detector for the purpose of moving it through unmanned aircraft. The invention relates to three drones, the first heading towards a land infected with mines to clear it (figure 1), the second deactivating the mine, and transporting it to a safe place (figure 2) and the third to ensure that the ground is well cleaned (figure 3). The first drone is equipped with a geolocation system, on which is placed an electromagnetic detector, a ground radar or an induction system. The second drone is equipped with a camera and two remote-controlled arms. The third drone is equipped with a remote control arm, a control unit for the arm, a camera to visualize the arms and a foot for landing. Figure for the abstract: figure 1.

Mine removal management system using drones and mine removal management method using the same

Unknown January 08, 2021 KR102200588B1

The present invention collects information on an area where landmines are expected to be buried, detects landmines using a drone in the region, but detects landmines by applying multiple sensors, and analyzes the detected landmines according to the type of landmine. Mine removal management system using drones that can mark mines, indicate where mines are buried to facilitate mine removal, or remove mines if possible, and manage such mines comprehensively, and mine removal management using the same It relates to a method that performs autonomous flight, includes a homecoming function and a detection result analysis function in case of an emergency during flight, and performs mine removal to minimize environmental damage. A drone 100 used to detect, remove, and collect data for preliminary surveys on the current tree and topsoil removal, wetlands in the DMZ, and natural river ecosystems, as well as landmine detection through images captured by a camera; It manages the mine detection area to be detected by the drone 100 or the area data expected to be buried, determines the mine removal according to the data acquired by the drone 100, and provides equipment and manager information for removing buried mines. A mine removal management server 200 that manages, determines a guideline for land mine removal by region according to the image and data captured by the drone 100, and establishes a plan for using the DMZ including preservation and development; And a drone controller (ground control equipment) 300 comprising a computer for controlling the flight of the drone 100; it provides a mine removal management system using a drone.

Method of detecting and removing mines using drone

Oh April 13, 2018 KR101832673B1

The present invention relates to a method for detecting and removing mines buried in the ground or underground by using an unmanned drones, and more particularly, to a method for detecting and removing land mines buried in ground or underground, This is a combination of mine detection and removal, such as man-made dangerous work to replace the military boundary line, such as war can occur in dangerous areas where mines can be detected and removed by using a drones mine detection and removal Removal method.

Marine crowding drone station

Sun et al. February 07, 2022 KR102356576B1

The marine swarm drone station according to the present invention comprises a body part consisting of a landing cleaning unit on which a drone is seated and cleaned, a battery charging unit for charging the battery of the drone, and a take-off unit from which the drone takes off.

Arrangement for supplying drones of a drone swarm

Müller et al. Naturetec GmbH May 12, 2022 WO2022096410A1

The invention relates to an arrangement for supplying drones (10) of a drone swarm with energy and/or consumable materials, wherein at least some of the energy or consumable materials is in package form; a store (18) for providing a plurality of packages (16) of energy and/or consumable materials is provided; and a package-changing station (36) for exchanging unloaded and/or consumed packages (16) with packages (16) from the store (18) is provided, characterised by a landing place (22) for the drones (10) of the drone swarm and conveying means (62) for conveying the landed drones (10) to a station (36).

Method and system for removing foreign matter from solar panel surface by using drone swarm flight

Paik et al. December 30, 2021 WO2021261695A1

The present invention relates to a method and system for removing foreign matter from the surface of a solar panel by using a drone swarm flight and, particularly, to a method and system for removing foreign matter from the surface of a solar panel by using a drone swarm flight, wherein a foreign matter detection drone having a camera and a foreign matter removal drone having a nozzle for spraying a washing solution stored in a washing solution storage part are used to remove foreign matter from the surface of a solar panel.

A smart city waste disposal system

Chong 马冲 October 03, 2023 CN116835172A

This application relates to a smart city garbage disposal system. A smart city garbage disposal system includes a number of smart garbage bins, a cloud platform and a number of drones. Several of the drones are wirelessly connected to the cloud platform; the smart garbage bins It includes an apron, a battery, a wireless charging device, a box, a solar charging plate and two support plates; the two support plates are arranged in an inverted V shape at the upper end of the box, and the solar charging plate and the apron are respectively arranged on The upper surface of the two supporting plates; the wireless charging device is arranged in the apron; the battery is arranged inside the box and is electrically connected to the solar charging plate. This application describes a smart city garbage disposal system that uses drones to put the garbage that has not been put into the smart trash cans back into the smart trash cans, and can supervise citizens to put the garbage correctly. The smart trash cans can be used as temporary parking for the drones. area, and charge the drone to improve the drone's cruising capability.

Drones for detection and removal of landmines

Binghou 吴炳厚 March 08, 2022 CN114148512A

The present invention relates to an unmanned aerial vehicle for detecting and removing mines, that is, an unmanned aerial vehicle for detecting and removing mines buried on the ground or underground, and more particularly, an unmanned aerial vehicle for detecting and removing mines. The removal of landmines detected by detection drones is a group of drones. The drones perform the dangerous work of detecting and removing landmines for people. They can be dropped on military borders and other places where war may break out. hazardous areas to detect and remove mines.

A kind of uav microwave mine clearing device

Unknown 中国万宝工程有限公司 January 30, 2024 CN220418246U

The utility model relates to a microwave mine clearing device for an unmanned aerial vehicle. A machine platform fixedly connected to the microwave mine clearing equipment and a passage marking device is provided at the lower part of the unmanned aerial vehicle body; The marking equipment is set parallel to the rear of the machine platform below the drone body. By installing microwave mine clearing equipment and road marking equipment on a drone, the drone is small and not restricted by terrain, so it can adapt to the needs of mine clearing and road clearance in a variety of terrains. It combines the drone with the microwave mine clearing equipment. , road marking equipment are combined to avoid any contact between the mine clearance system and the ground, and mine clearance is carried out in the air, fully ensuring the safety of mine clearance personnel.

Drone with ultra-high frequency unit for the detection and disposal of explosive devices and mines

Unknown Іван Богданович Гевко November 08, 2023 UA154363U

A drone with a unit of ultra-high frequencies for the detection and disposal of explosive devices and mines, which contains a detonation module for the disposal of mines located on a minefield. The detonation module for disarming the mines located in the minefield is fixed in the lower part of the unmanned aerial vehicle on one side of it, and the irradiator, which provides a modulated ultra-high frequency signal for mine search, on the other side, in addition, the unit is fixed on the unmanned aerial vehicle delivery of a modulated signal of ultra-high frequencies for the search of mines and their detonation.

A method and system for mine detection based on swarm intelligence

Ke et al. 汕头大学 June 11, 2021 CN112946766A

The invention discloses a landmine detection method and system based on swarm intelligence, and relates to the technical field of landmine detection. The system includes: a detection drone group and a plurality of bases; Each detection drone is correspondingly deployed on a base; the method is as follows: set up multiple UWB positioning devices at the boundary of the operation area to indicate the operation area to the detection drone group; the detection drone group adopts formation control The flight formation determined by the algorithm flies in formation, each detection drone detects the operation area, and reports the determined mine detection results to the second ad hoc network communication device on the base in real time; when the detection drone group completes the detection of the entire detection area After the task, each detection drone flies toward its respective base, and the detection drone is recovered through the second laser radar and the first laser radar. The invention can improve the accuracy of mine detection and reduce the detection cost.

A uav-based intelligent garbage collection system and recycling method

Hengjie et al. 苏州中科先进技术研究院有限公司 April 06, 2021 CN112607244A

The present invention relates to a drone-based intelligent garbage recycling system and recycling method, comprising a drone module, an electromagnetic fixing device and a control unit, wherein the drone module comprises a drone and is communicatively connected to the drone A man-machine intelligent recycling machine; the intelligent recycling machine is arranged on the top of the garbage can, and the UAV is accurately positioned based on an ultra-wideband positioning system; the electromagnetic fixing device is arranged in the garbage recycling frame in the garbage can; The control unit is communicatively connected to the electromagnetic fixing device and the UAV module, and the control unit applies a forward or reverse direct current excitation current to the electromagnetic fixing device to realize the electromagnetic fixing device Fixing and loosening garbage bags; the control unit controls the intelligent recycling machine to guide the drone in and out of the garbage bin, and controls the garbage bag recycling operation and the garbage bag replacement operation of the drone in the garbage bin .

Dynamic monitoring device for comprehensive mine management using unmanned aerial vehicle remote sensing technology

Mengling 薛梦灵 August 11, 2020 CN211223908U

The utility model provides a dynamic monitoring device for comprehensive mine management using unmanned aerial vehicle remote sensing technology, comprising: an unmanned aerial vehicle body; monitoring equipment, wherein the monitoring equipment is arranged at the bottom of the unmanned aerial vehicle body; The cleaning device is fixedly installed on the front of the drone body, and the cleaning device includes an installation box. The dynamic monitoring device for comprehensive mine management using the remote sensing technology of the unmanned aerial vehicle provided by the utility model has a cleaning device. The lens is clean and does not need to be returned for cleaning, which improves work efficiency, and the cleaning brush can be disassembled and replaced, and the operation is simple and convenient. The service life of the man-machine is that the drone falls more smoothly.

Detection and removal of mines using drones

Oh March 14, 2019 WO2019050298A1

The present invention relates to a method for detecting and eliminating land mines located on the ground or buried beneath the ground using unmanned drones and, more specifically, a method for detecting and eliminating land-mines on the ground. the use of drones, in which a detection drone is used to detect landmines and an elimination drone to eliminate the landmines detected by the detection drone are an aircraft; and work that is dangerous to be done directly by people, such as the detection and disposal of landmines, is done by drones rather than by people. UAVs can be sent to dangerous areas, such as military borders where wars could break out, to detect and eliminate landmines.

System for collecting garbage using a plurality of drones that can be interlocked

Unknown June 10, 2022 KR102408006B1

The present invention relates to a garbage collection system using a drone, and more particularly, to a garbage collection system that collects a garbage storage device storing garbage into a garbage collection site using an unmanned flying device.

Hybrid mine detection drones equipped with explosive detection sensors and long-range metal detection sensors

Park May 13, 2019 KR101976483B1

Recently, the need for more efficient equipment to detect and remove more than 200 million explosives (explosives, mines, etc.) buried near the ceasefire has been increasing, according to the reconciliation mood of South Korea and North Korea. The reason for this is that there are many buried plastic mines and wooden mines that are very difficult to detect with metal mines as well as buried explosives. Therefore, when searching only with the metal detectors currently owned by ROK troops, It takes more than a year. The present invention relates to a hybrid mine detection drones equipped with an explosive detection sensor and a remote metal detection sensor, and is designed to detect explosives and mines more safely and more rapidly than conventional mine detectors. It is capable of detecting all kinds of explosives, metal mines and non-metal mines more quickly and safely than detection by conventional techniques, since it can detect the components of explosives that are leaked from buried explosives or land mines.

Group intelligence-based land mine detection method and system

Unknown 汕头大学 April 01, 2022 CN112946766B

The invention discloses a landmine detection method and a system based on group intelligence, relating to the technical field of landmine detection, wherein the system comprises: the detection unmanned aerial vehicle group comprises at least two detection unmanned aerial vehicles, and each detection unmanned aerial vehicle is correspondingly arranged on one base; the method comprises the following steps: arranging a plurality of UWB positioning devices at intervals on the boundary of a working area so as to indicate the working area to the detection unmanned aerial vehicle group; the detection unmanned aerial vehicle group adopts flight formation determined by a formation control algorithm to fly, each detection unmanned aerial vehicle detects the operation area, and the determined mine detection result is reported to the second ad hoc network communication device of the base in real time; after the detection unmanned aerial vehicle cluster finishes the detection task of the whole detection area, each detection unmanned aerial vehicle flies towards the direction of the respective base, and the recovery of the detection unmanned aerial vehicles is realized through the second laser radar and the first laser radar.

Method of remote search and detection of explosive objects and mines

Unknown Ігор Іванович Слюсарь October 05, 2022 UA151975U

The method of remote search and detection of explosive objects and mines consists in the use of a drone with a video camera, a thermal imager, a metal detector, which examines areas of the earth in order to detect land mines by determining their position on a 3D map, for the formation of which, as well as for control and management of the drone, use a ground station that provides manual and automatic drone operation modes, with the possibility of a programmable flight pattern based on GPS/RTK coordinates. At the same time, the drone is equipped with a non-linear radar, which is controlled remotely using wireless communication technologies.

Method for determining the position of a land mine located in a search area

Schartel et al. Endress+Hauser SE+Co. KG December 06, 2018
DE102017112210A1

The invention relates to a method for determining the position (y ⇀) a land mine (2) located in a search area (4) by means of an SAR-based distance measuring device (5) mounted on an unmanned aircraft (1). It comprises the following method steps: - flying around the search area (4) along a circular trajectory (3) at a previously known altitude (h), a transmit signal (S HF) being emitted in the direction of the search area (4) during flying, and a signal transmitted by reflection echo signal (E HF) generated at the landmine (1) is received by the distance measuring device (5): - determination of a distance information (d j) and assignment of a corresponding flight position (x l ⇀) on the trajectory (3) to each of the stored echo signals (E HF); - Calculation of the position (y ⇀) the landmine (1) based on the flight position-dependent distance information (d j) and the altitude (h). This method provides a tamper-proof, simple and accurate method of locating landmines regardless of whether the landmine (2) is buried.

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