

TECHNICAL POSSIBILITIES OF THE USE OF UNMANNED MOBILE MODEL TO CAPTURE TRAFFIC ACCIDENTS

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Problem

Use ruletochnoho and stereofotohrammetrychnoho method during accidents is not innovation. Terrestrial laser scanning technology is increasingly important, but significant price everyday laser scanner prevents the use of this device in the fixing of road accidents [1].

In this regard, mapping traffic accidents (RTA) requires new technologies, devices, methods that meet a number of modern requirements, helped the accident record without creating congestion on the roads, do not interfere with other road users.

Developers unmanned mobile models (BMM) offered his invention applied to civilian purposes, for entertainment, but the full list of works not yet defined.

Analysis of recent research and publications related to the solution of this problem

Note that the use of drones for aeroznimannya still considered small in length ploschadkovykh and linear objects [2]. Many publications devoted to the problematic use of unmanned models aérozyomtsi mapping [3 - 5], analyzing the structure of building unmanned aircraft systems [6], the use of the army and the economy [7], the use in agriculture [8].

Outstanding of the problem

Imperfection of existing methods mentioned above when drafting diagram accidents requires modern automated techniques, which resulted to address a wide spectrum of problems in recording and mapping the accident.

Problem problem

In view of the above mentioned aspects task - to get acquainted with the possibilities of using kvadroptera Galaxy Visitor 2 for mapping software automated registration system, mapping and analysis of accidents.

The main material

Kvadroptera Nine Eagles Galaxy Visitor 2 (Fig. 1) - a miniature copy DJI Phantom [9]. Best of engineers presented the famous model, which in a small package has several features previously available only to major engineering skills.

This miniature kvadropteri realized three unique features (for kvadroptera this size and class), which is shown in Table 1.

Settings

power screws recommended value of 30% fly indoors and 38% for open areas

Maintenance

flight direction (AUX2) This function can not be afraid of disorientation in space - the model can always return to the position in the direction of the transmitter

Automatically

return to

direction control board (AUX1) With the loss of visual control kvadropterom, you can return by pressing a single button

If stabilization system, kvadroptera can be used for fixing the accident, since the presence of gusty wind and other weather conditions are no longer an obstacle in mapping the accident.

Setting screws spending power can be done pressing and holding the right toggle switch control panel. As a result, a long monotonous beep will turn to intermittent. Setting the value rekomenduyemoyi costs will power by moving the toggle switch left uphill to obtain the desired value to be displayed on the screen

display in percentage (Fig. 2).

With power costs over 50% control is extremely difficult because the movement is unpredictable. This mode is intended only for advanced users only on special occasions (such as strong wind).

To simplify piloting function is available regardless of the direction of keeping the spatial position of the model. Pilot - beginners it will help prevent the most dangerous errors, and for professionals it is - an opportunity to fully concentrate on complex tasks such as video. To activate the included transmitter need to put together a model to antenna pointing clearly to the red LED, and press AUX1.

The special feature of this model - automatic return. For the first time kvadroptera so small is able to automatically return to the user. This feature helps prevent loss model even in the absence of visual control. Mode is enabled, returning to customize speed avtopovernennya briefly press the left horizontal trimmer. The more flashing red LED on the body of the model - the higher the speed. After installing the required speed settings are stored. Press the button AUX1 model automatically returns to the user. However, the intervention in the management of other channels of radio communication function avtopovernennya disconnected, restored normal flight mode.

As the trial kvadrokopter clearly holds horizon and sensually responsive to user commands, and bright light housing makes it possible to fly in the dark. In this model, there are three modes of flight - mode for novice and power user mode 3D flight. Main specifications kvadrokoptera given in Table 2 [10].

Kvadrokopter equipped with an overhead HD video camera (Fig. 3), which is guided remotely, push the appropriate button. Photography and video functions help to successfully capture the right moment the accident. Image quality is impressively high for such a small model, making it easy to handle pictures to get the final result. MicroSD memory card 2 GB allows you to store the results of both video and photography for further computer processing. The body model is made of lightweight and durable plastic, it protects electronics. Rechargeable battery model (Fig. 4) is placed in a closed compartment. The lid latch to easily and quickly opened and closed to replace the battery. Tests have shown that battery charge is sufficient to obtain 35 to 40 images. Availability of USB - adapter facilitates charging.

Practical use BMM images in all weather conditions [11] allowed us to obtain interesting results (Table 3).

The analysis of the images, examples of which are illustrated in Figures 5-7 demonstrated the ease decryption objects that were to be shooting on a sunny day with the wind of 6 m / s and a day of snow and rain. The photo clearly expressed tire prints on the surface of earth and snow cover that will identify and show the diagrams braking distance.

Photography can be executed kvadrokopterom study in computer programs to get the final result - schemes scene.

Image quality meets the required accuracy for mapping traffic accidents, can easily scale the photographing using the known dimensions of vehicles, and display all the relevant points in the photograph. Since the circuit accidents are often additional materials to judges, should target further research to create a computer program for a technical report on the accident in automatic mode.

Findings

Research functions kvadrokoptera give grounds to assert the possibility of using this model to capture accident. If stabilization system gusty wind will not hinder in mapping. The model is equipped with modern technologies that enable automated store pictures on the memory card and MicroSD card reader to transfer through the material to the computer. Image quality meets the required accuracy in further processing images for charting. Kvadrokopter could become a new instrument in the fixing of road accidents if and to develop a new method of mapping technology to provide automated registration system for accidents.

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Discussed are the technical possibility of using unmanned mobile models to capture traffic accidents. Analyzed three functions: power tuning screws, hold the direction of flight, automatic return in the direction of the remote control. The results of the practical use of the model in different weather

