Participant Koshmambetov Aimer

Scientific adviser: Kotov A.O. and Kotov S.O.

Name of the project: Unmanned system of floating apparatus for cleaning water bodies

Description.

Water bodies are polluted with a large amount of solid and liquid waste as a result of human activities: plastic, organic and inorganic waste, oil, and other debris are the common pollutants. This violates the ecological balance of water bodies, reduces the number of its inhabitants, and hinders further economic activity. Theoretically, waste can be collected and recycled. The hassle of cleaning is due to the problem of a large collection area with a small mass of the resulting product, which is solved by our proposal: the use of automated drones. One of the main features of the project is several modes of collection of household waste and oil products. It can perform cleaning without human control. Waste collection uses GPS and a neural network. The operator specifies only GPS coordinates. Various options for ready-made solutions were studied and optimal solutions were selected: design, hull shape, ski shape, engine location, booms and fishing nets. The design of the two skis is very stable and simple. The skis themselves were assembled from the remains of bumpers, as they are quite light and cheap. The radio control on the Arduino Uno is made with three different radio modules, the maximum distance is 5km. For programming the neural network, I used open source projects. To use the neural network on board the boat, I used a Raspberry pi that I connected to an Arduino Uno. In the current configuration, the drone has a speed of 3 km / h with a speed decrease of 0.02-0.03 m / s for every 300 grams of waste. The drone has the ability to collect up to 8kg of waste per rotation. Approximate calculations of the project implementation were carried out. Payback was 1.7 years, profitability 29%, Internal rate of return (IRR) 56.18%.

Conclusion.

In the work, an unmanned system of floating apparatus for cleaning water bodies was created, surpassing analogues in engine power, speed of collection and distribution of plastic waste.

Link to GitHub: https://github.com/aimyr/Unmanned-system-of-floating-apparatus-for-cleaning-water-bodies

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