

**Silesian University of Technology as a Center for Modern Education
Based on Research and Innovation**

POWR-03.05.00-00-Z098/17-00

PBL – Project Based Learning		
Title:	Hardware-software Module for Vaccine Distribution Using Unmanned Multi-rotor Platform	
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The presented solution is a dedicated robotic tool in the form of an unmanned multi-rotor platform, equipped with a module enabling precise distribution of vaccines in the oral vaccination of foxes against rabies. The aim of the project was to design and develop a hardware-software module for automatic distribution of vaccines in precisely defined places. The dedicated module also performs automatic registration and archiving of the geographical coordinates of the drop locations. The specialized drone is equipped with an autonomously powered vaccine distribution module integrated with the supporting structure. It has a container with replaceable magazines for vaccines mounted on the feeder chamber. The vaccine distribution module has a dedicated control system that communicates with the central drone control unit. The container is equipped with four interchangeable magazines, which guarantees minimal downtime between successive flights and a safe way to store other vaccines already placed in the refrigerated storage in a suitable temperature condition while waiting for the next flight. The lifetime of the vaccine for use is limited by the time from the moment it is taken out of the refrigerated storage to the time of discharge. Therefore the entire drop area has been divided into sub-areas where the single transit time is within the lifetime of the vaccine for use.

Introduced novelties:

1. The unique in the world solution of the flying platform with the hardware-software module ensuring the possibility of distributing vaccines in the oral immunization of foxes against rabies.
2. A proprietary mechatronic module placed on an unmanned aerial vehicle enabling automatic vaccine distribution in strictly defined places.
3. Automatic registration and archiving of the geographical coordinates of the vaccine drop coordinates.
4. The entire process of distributing vaccines in immunizing foxes against rabies is automated, unmanned and autonomous.



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