СЕКЦІЯ 1
ЕКОЛОГІЧНА БЕЗПЕКА ПРОМИСЛОВОСТІ ТА ВІЙСЬКОВО-ПРОМИСЛОВОГО КОМПЛЕКСУ

UDC 629.78.037.8 https://doi.org/10.18372/2786-8168.18.18523

V. V. Huz, student
National Aviation University, Kyiv

METHODS OF MEASURING UNMANNED AERIAL VEHICLE FLIGHT PARAMETERS FOR THE PURPOSES OF ANALYSIS OF INDUSTRIAL FACILITIES ENVIRONMENTAL PERFORMANCE

Abstract. *The development of methods for measuring UAV flight parameters helps to reveal the potential of unmanned aerial systems for various industries and needs.*
Keywords: unmanned aerial vehicles (UAVs), photogrammetry, optical sensors.

Introduction. Unmanned aerial vehicles (UAVs) are rapidly evolving and gaining new importance in various industries such as agriculture, geodesy, mapping, and others. Various methods, including various technical approaches, will help to improve the efficiency of UAVs during flight, allowing to obtain information about the movement and condition of the aircraft during flight.

Methods and applications. The use of various methods of measuring the flight parameters of unmanned aerial vehicles (UAVs) made it possible to study and reveal many features of these technological systems. Measurement of flight parameters by different methods allows obtaining data with different accuracy and reliability. These are various measuring devices that can be installed on UAVs, for example: GPS receivers, barometers, accelerometers, gyroscopes. They can quickly provide valuable flight data, but the weight of the sensors can limit their use on some types of UAVs.

It should be noted that optical flow sensors play an important role. Optical sensors are used to measure the movement of the UAV relative to the environment based on the analysis of optical images. These sensors can help in difficult situations and can be analogues of other sensors, for example, indoors or in dense vegetation.

This list includes photogrammetry, where the use of this method will be simple and effective. This makes it possible to perform measurements with high accuracy, especially when using high-quality cameras.

Results and Discussions. The main feature is that the use of different measurement methods allows you to adapt unmanned aerial vehicles to different industries and tasks. By increasing payload, range and improving autonomous navigation, UAVs can perform a wider range of tasks with greater efficiency and precision. Continuous technological development improves the versatility of imaging and sensing, enabling environmental monitoring with unprecedented detail and accuracy. And if necessary, get valuable

information about various objects. Provide seamless connection and real-time data transfer, which allows you to work comfortably and efficiently at different distances. As UAV technology continues to evolve, customization for specialized applications, integration of safety features, and optimization of maintenance procedures are essential to ensure their reliability, safety, and effectiveness in various missions.

By tailoring UAVs to specific requirements and operational objectives, a variety of organizations can maximize the value of their aerial assets while minimizing the risks and costs associated with manual intervention or traditional methods. In addition, the constant improvement and adaptation of UAVs allows them to meet new needs and solve new challenges of humanity. Unlocking the full potential of unmanned aerial systems will depend on strategic decisions in today's world.

Conclusions. The development of methods for measuring UAV flight parameters helps to fully reveal the potential of unmanned aerial systems in various fields. Through the use of different measurement methods, such as GPS receivers, optical sensors and photogrammetry, UAVs can be adapted to specific requirements, optimizing their performance and efficiency. However, realizing the full potential of UAVs will require a concerted effort to address regulatory challenges, ensure safety and compliance, and promote public acceptance. Ultimately, strategic decisions and continuous research and development are needed to maximize the benefits of unmanned aviation systems and shape a future in which these technologies will drive progress and innovation in air operations and beyond.

References

1. Mesquita, G.; Mulero-Pázmány, M.; Wich, S.; Rodriguez-Teijeiro, J.D. A practical approach with drones, smartphone and tracking tags for potential real-time tracking animal. Curr. Zool. 2022, 68.

2. Saunders, D.; Nguyen, H.; Cowen, S.; Magrath, M.; Marsh, K.; Bell, S.; Bobruk, J. Radio-tracking wildlife with drones: A viewshed analysis quantifying survey coverage across diverse landscapes. Wildl. Res. 2022, 49, 1–10.

3. Tansuriyavong, S.; Koja, H.; Kyan, M.; Anezaki, T. The Development of Wildlife Tracking System Using Mobile Phone Communication Network and Drone. In Proceedings of the 2018 International Conference on Intelligent Informatics and Biomedical Sciences (ICIIBMS), Bangkok, Thailand, 21–24 October 2018; pp. 351–354.

Supervisor – T. V. Saienko, D.Ped.S., Professor