Thus, ensuring the safety of UAV flights by preventing collisions is of paramount importance.

Currently, the concept of dynamic density corridors D2-C2 is a promising solution. It involves organizing airspace into dynamic segments (volumes) and high-speed corridors according to predefined rules for geo-orientation of flights. Dynamic segments allow for quick and flexible restructuring of airspace depending on current traffic density and UAV characteristics, while corridors with fixed directions of movement organize their flows so that they fly in agreed directions, reducing the likelihood of head-on collisions.

It is proposed to introduce means of predicting possible conflicts based on machine learning technologies to improve the efficiency of UAV flight path planning methods. The essence of the introduction is to anticipate potentially dangerous encounters in advance during the flight planning and execution stages and to dynamically adjust the UAV flight path to avoid collisions.

A neural network model has been developed that uses data on the current flight of the UAV and the surrounding environment to predict the risk of collision with obstacles (both static and moving) at a given interval.

The existing trajectory planning method (based on the D2-C2 concept) has been improved by integrating a conflict prediction module using an LSTM network.

IMPROVED MODEL OF RADIO HEAT EMISSION FROM AN OBJECT

V. Kudriashov[1], PhD, Senior Researcher;
O. Kolomiitsev[2], Doctor of Engineering Science, Professor,
Honored Inventor of Ukraine;
T. Kulieshova[3]; A. Lernatovych[4]
[1]O.Ya. Usikov Institute for Radiophysics and Electronics
of the National Academy of Sciences of Ukraine;
[2]National Technical University "Kharkiv Polytechnic Institute";
[3]Ivan Kozhedub Kharkiv National Air Force University;
[4]State Scientific Research Institute
of Armament and Military Equipment Testing and Certification

It is known that heated bodies (objects) emit light, infrared, and ultraviolet waves, the intensity of whose thermal radiation continuously changes. At the same time, the magnitude and speed of change are unpredictable. That is, thermal radiation differs from the radiation generated by:

– thermal radiation occupies a very wide range of wavelengths;

– the power and spectral density of thermal radiation are not constant and fluctuate continuously.

Thus, improving the model of radio thermal radiation of an object is a relevant scientific task.

The report examines the characteristics of thermal radiation from objects in the radio range. It is noted that thermal radiation from objects differs from generated radiation in that thermal radiation occupies a very wide range of wavelengths. Its power and spectral density fluctuate continuously.

The physical essence of thermal radiation of various substances and objects is revealed. The main laws of thermal radiation are analyzed. Calculations of the spectral density of radiation of an object depending on its frequency and temperature are presented.

The model of radio thermal radiation of an object has been improved. The model is presented in the form of total radiation from several tiny elementary antennas powered by noise currents distributed throughout the volume of the radiator. It has been noted that radio heat radiation is caused by ultra-high frequency noise currents.

The intensity of radiation depends on the electrical characteristics of the radiating objects: conductivity and dielectric permeability. The conductivity of an object largely determines its absorption properties. Moreover, the better an object absorbs the energy of external radiation, the better it is as a thermal emitter.

UNIFIED STRUCTURE OF COMBAT MODULES

G. Nikiforov; O. Cherednikov, PhD in Engineering, Associate Professor;
V. Chupryna, Doctor of Engineering Sciences, Associate Professor; T. Badyor
State Scientific Research Institute
of Armament and Military Equipment Testing and Certification

The unification of combat remotely controlled modules for machine guns is an important direction in the development of the design process of modern weapons, which allows not only to increase the effectiveness of firepower, but also to optimize production, logistics, maintenance and training of personnel. Taking into account the wide use of different types of machine guns (light, medium, large-caliber), as well as the variety of combat platforms (armored vehicles, pickup trucks, boats, stationary posts, drones), the unification of modules is a condition for the effective use of resources in combat conditions.