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Author: Ms. Ulkar Habibullayeva
National Aviation Academy - Azerbaijan, Azerbaijan

Mr. Ilham Mirzayev
National Aviation Academy - Azerbaijan, Azerbaijan

DRONE AND AI BASED NEW CONCEPTS FOR ENSURING THE SAFETY OF ASTRONAUTS.

Abstract

In modern times, drones have been integrated into many fields. We can also use drones to ensure security on space stations. It can be very useful in ensuring the vital safety of astronauts. If we ensure that drones move around astronauts when they leave the space station for exploration, we can improve the safety process. So, adding sensors such as temperature, pressure, etc. to drones we can collect and analyze data through them. These sensors continuously monitor variables such as pressure and temperature and alert astronauts in case of any deviation from the standard. Thanks to these warnings, astronauts can make personal decisions or follow advisory warnings provided by the drones. By advisory warnings, examples include using oxygen tanks or activating cooling systems.

In our research we have explored concepts for providing specific safety warnings to astronauts by analyzing collected data using artificial intelligence. We have taken certain measurements of this process by moving drones around astronauts in a simulation environment. Variables are collected in real time via drones, and a warning signal is sent to the astronauts if any errors occur. This data can also be stored for a long time. We measure the mean, standard deviation, normalization, and correlation matrix of the data. As a first concept, we add instant alerts. Another concept is that we can make predictions about potential changes that may occur in the future based on long-term stored data. By using machine learning algorithms, we train the model based on various variables. Through all these analyses, we use graphs (3D or interactive visualizations) to distinguish anomalies and present a more understandable view. As a result, astronauts can make certain decisions simply by looking at the graph, without needing any signals or special alerts.

The use of artificial intelligence and machine learning plays a significant role in prediction and data optimization. This allows us to detect critical changes in space stations in a timely manner. The application of drones in space, combined with artificial intelligence, marks the beginning of a new era. We can also apply the effective results we achieve on Earth to space. The main purpose is to accurately calculate and implement concepts in a microgravity environment. The application of these new technologies aims to ensure the effective and safe implementation of space missions.