Cyber Drone Simulation System

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Aim

In daily life, drones are used in many areas where human hands cannot reach. While reaching these areas, both financial and hardware challenges can be experienced due to external factors or user errors. In this project, it was aimed to teach people how to use drones and show drone behaviors in order to overcome the difficulties mentioned.

Objectives

It is very difficult for users to use the drone efficiently at first. Because getting used to the ergonomic structure of the drone and using its maneuverability effectively requires a certain experience. Therefore, damage caused by the user may occur initially. The consequences of these accidents often result in huge costs. In addition, the inability to pre-prepare for external factors increases the damage to drones. So how can we find a solution in this situation?

With the development of the game engines, the motion systems of the game objects close to authenticity. The feeling of using drones in real life has been implemented on the game engine with maximum reality perception.

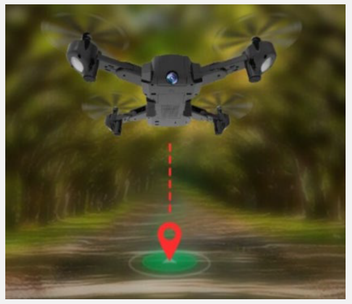
Implementation

During the construction of this project, research was carried out on the ergonomic structure of drones and the physical dimensions of their movements. [https://www.wired.com/2017/05/the-physics-of-drones/] With the research, physical factors for the behavior of drones were integrated on the unity game engine. The situations that drones may encounter in real life were implemented in unity environment such as windy weather.

Virtual maps have been created where users can test these conditions. The multiplayer mode has also been implemented so that they can observe others besides themselves. The management of the entire system on Unity was provided over the web. Thus, an integrated system with both unity game engine and website was produced.

Evaluation

It was necessary to test the mobility of various drone models available on the market. For this, the assets of the most preferred models were found and their physical features were integrated. In general, 5 different types of drones, 3 different weather conditions of different intensities and more than two maps were implemented in the simulation environment. Under these conditions, users can realistically move their drones such as forward, backward, takeoff, sideways and tumble.



In addition, it has a web-side system administrator and provides management of user data. At the same time, users can update their information in line with their authorization. Basically, it is an integrated system using web and unity designed to increase ease of use.

Conclusion

The cyber drone will overcome many obstacles faced by today's pilots. It offers pilots a good experience with its mobility and choice of environment. In addition to being sufficient with mobility in the first version, the choice of map and environment is open to improvement in the future. We presented this problem experienced by drone pilots with a cyber drone, which is a highly interactive tool. The main contribution of our study was to enable us to simulate the mobility of drones by showing the perception of reality in a simulation environment. In addition, the product we produced contribute to future drone simulators and compilers.

References

1.Rhett ALLAIN (2017), How Do Drones Fly? Physics, of Course!, Website