

Title :

Unmanned fixed-wing aircraft for ground-level ozone monitoring

Abstract :

This project proposes the Unmanned with a fixed-wing aircraft attached with an ozone detector mounted on the nose of the drone to measure ground-level ozone from concentrations originates from automobile emissions.

The current ozone measures at low altitudes are primarily obtained from weather or research balloons provide only vertical profiles, which lack spatial control, reusability and directional control. This limits their effectiveness for studying pollution sources such as roadways.

Whereas my project focuses on a fixed-wing drone platform with ozone sensors to enable long endurance and wide area monitoring, compared to multirotor platforms. Also, extend flight time and improve sustainability. A rechargeable battery with solar panels mounted on the wings, which requires careful consideration of weight, power output and aerodynamic efficiency.

For the cost reduction, the platform is planned to design the fuselage structural parts using 3D printing, which enables low-cost prototyping and easy modification. This platform fundamentally improves environmental data availability by enabling low-cost, sustainable monitoring of air quality, supporting pollution control strategies and air pollution-related health research