Path Planning & Secure Positioning for an Unmanned Ariel Vehicle

Abstract:

Now a days DRONE TECHNOLOGY became an important role in field of Ariel Robotics. DRONE TECHNOLOGY skyrocketed over the past decade driving costs down and the number of applications up. UAV is defined as an aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely, can be expandable or recoverable, and can carry a lethal or nonlethal payload. It is controlled either autonomously by on-board computers or by remote control of a pilot on the ground. Its usage is currently limited by difficulties such as satellite communication and cost. A Drone has been built that can be operated by radio frequency controller and send live audio-visual feedback. The developed Drone control system has been simulated in MATLAB/Simulink. The simulation shows a very stable operation and control of the developed Drone. Microcontroller based drone control system has also been developed where a RF transmitter and receiver operating in the frequency of 2.4 GHz are used for remote operation for the Drone. Earlier, Drones were deployed for military applications such as spying on both domestic and international threats. The developed drone in this work can be used for a number of applications, such as policing, firefighting, monitoring flood effected areas, recording video footage from impassable areas and both military and non-military security work. In addition, using an Android mobile device incorporation with GPS has been used for live position tracking of Drone and real time audio-visual feedback from Drone.

In this Paper, We are discussing about the challenges that are being faced regarding how to find a conventional path, Obstacle detection and Collision avoidance and their Problem Formulation. We will discuss about the path planning algorithms such as (1) Three path planning algorithm: LOCALIZER BEE, VERIFIER BEE, PRECISE VERIFIER BEE. (2) VDPGT & (3) Triple state path detection algorithm and the use of low cost sensors for collision avoidance and obstacle detection.