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Review paper on unmanned aerial vehicles

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Abstract: Unmanned Aerial Vehicle (UAV) is commonly known as Drone.It is extensively being used these years.Nowdays drones are used in various Military applications, Commercial Cargo Transport, and 3-D Mapping etc. For supporting the weight of the plane, and shock absorption functions, landing gear design is highly needed.Unmanned aerial vehicles (UAV) are the logical successors to modern aircraft and advancements in automated technology. The current generation of UAV's is focused on wartime capabilities and reconnaissance, leaving an existing market untapped by UAV technology: the commercial field. There are thousands of applications for UAV technology in the civilian market, from quick response applications and media outlets to communication technicians and horticulturalists. The vehicle can even act as a path.

I. INTRODUCTION

UAV (unmanned aerial vehicle) also known as drone, is an aircraft without a human pilot on board. Its flight is controlled either autonomously by computers in the vehicle or under the remote control of a pilot on the ground or in another vehicle. UAV has many applications besides the military applications with which "drones" became most associated. Numerous civil aviation uses have been developed, including aerial surveying of crops, acrobatic aerial footage in filmmaking, search and rescue operations, inspecting power lines and pipelines, and counting wildlife, business advertisements etc. A small scale UAV can be designed using EPP foam, brushless motor, servos moter, Electronic Speed Controller (ESC), 2.4 GHz Transmitter and Receiver (Tx/Rx). The UAV makes use of eleven (delta) mixing which reduces the hardware requirements and complexity in designing the model. The smaller UAV can be used for commercial aerial surveillance, remote sensing, scientific research, etc. There are many applications for UAV technology in the military and civilian market, from emergency response applications and media outlets to communication technicians and horticulturalists. It is a fact, though a very simple fact, that unmanned aerial vehicles (UAVs) are small aircraft, more or less. This means that the UAVs follow the laws of thermodynamics and the laws of physics. UAVs are even more varied in their physical characteristics than are manned aircraft. Their size generally varies with wingspans ranging from 7 inches to 13 ft.Mini-UAVs in the current field have wingspans ranging from 21 inches to 10 ft. These UAVs can be remotely controlled or can fly autonomously based on pre-programmed flight plans. They carry a variety of payloads including infrared cameras, television cameras and jamming electronics. UAVs are of growing importance to military operations, but they can also be used in a variety of civilian applications. Potential military applications for mini-UAVs include local reconnaissance, target identification, post-strike battle damage assessment, electronic warfare (including radar jamming) and combat search and rescue.Civilian applications include monitoring inspection of oil pipelines, traffic, or power-lines, border surveillance, killing harmful insects, surveying wildlife, real estate photography, monitoring concentrations in chemical spills and more.

2. REQUIRED HARDWARE

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II. RESEARCH METHODOLOGY

This review article is the systematic review type in which was identified, evaluated, and synthesized all information about UAVs heterogeneous networks with papers from 2010 until 2020. The databases consulted were IEEE Xplore Digital Library, Progress in Aerospace Sciences, Academy Google and Science, college repositories, Air Power Journal, and military and civil news portals. Consequently, the information was evaluated and synthesized by a QFD Matrix, and thus, was identified the UAV necessities focused on requirements, recommendations, design baseline, and technical solutions based in the aeronautical bibliography.
The landing gear absorbs impact loadings from landings and guarantees stability at the taxi phase, which must be three times the UAV weight.42 The tricycle configuration will accomplish these needs, adding that the engine and propeller could be protected from ground strikes.43 Unlike, there are innovative configurations, such as catapults or rocket assistance for take-off, and nets or parachutes for landing. Other configurations combine some or all of the helicopter characteristics with a wing fixed aircraft, but they represent mechanically complex solutions with attendant weight and cost penalties.

In general, UAVs avionics systems are lighter, more compact and simpler than their manned aircraft versions. From standard aviation avionics, these avionics systems are similar. Only under specialized requirements, the development of some avionics systems is dedicated to UAVs.25 Likely, supported by redundant safety systems, the most important parts of the onboard system are IMUs (Inertial Measurement Unit) combined with the GPS signal processor, transponder, engine controller system, electronically scanned array radars, VHF communication and navigation systems, thermal vision cameras, LIDAR sensor, RGB color sensor, infrared sensors, multispectral and hyper-spectral observation sensor systems (day and night) EO/IR, video tracking systems, high-resolution SAR and ISAR radars, signal intelligence (SIGINT), communication intelligence (COMINT), a longer range and high-resolution ISR sensors, and sensors to detect and avoid collisions using ultrasonic, infrared, time-of-flight vision, 3D-positioning, and real-time detection, figure 6.40,41.

III. CONFIGURATIONS AND DESIGN REQUIREMENTS

The UAV’s design should respond to reducing manning, this results in a control of multiple heterogeneous UAVs to a small number of human operators, and thus, low workload, low military inactivity, and war field misunderstanding.39 Consequently, each UAV concept is a complex problem that requires a different design approach according to infrastructure conditions, weather conditions, geographical conditions, technology available, pilots’ skills, air defense, national security conditions, and flight-paths conditions, under minimum.

IV. CONCLUSION

a) Heterogeneous networks must work with ground sensors, manned and unmanned aircraft, and satellites. The fact that they are mobile introduces significant challenges and advantages for future applications, being the preliminary sizing shown a platform to begin to materialize a UAV for multi-agent systems. b) As heterogeneous networks possess stringent resource and design constraints, there is a need to design new wireless networking techniques and protocols to enhance the capabilities of existing architectures. c) The use of wireless networks will make it possible that several hard-to-reach maritime, mountains, and air areas will be full of UAVs. This could provide communication services aiming to resolved technological challenges related to the wireless networks. d) The manpower, personnel, training, environment, safety and occupational health, engineering, survivability, and habitability must be taken into account as systems mature and technology involves. In this way, the UAVs implementation successful will depend on how human systems integrate with the UAVs systems.

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