One Pager

DRONIX ENGINEERING

Emergency Parachute Landing
Organization name: Dronix Engineering

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Main points:

Develop a drone safety feature incorporating parachute deployment for emergency landings.

Solution:

Detect the potential for a crash while a drone is in flight and initiate the deployment of a parachute for a secure landing.

Problem:

In case of an emergency situation during a drone's flight, it is essential to develop a solution that prevents damage to the drone and the surrounding area during a crash landing.

The methodology:

Risk Analysis and Assessment:
- Identify potential failure points
- Assess environmental factors
- Guide parachute system development

Aerodynamic Modeling and Simulation:
- Utilize advanced tools
- Analyze drone-parachute interaction
- Aim for stable deployment and controlled descent

Integration with Drone Electronics:
- Ensure seamless integration
- Trigger parachute deployment in emergencies

System domain: R&D

Modules:

ArduPilot

Interfaces:

QGroundControl, Gazebo Simulator

Description of system components:

CPU: OrangeCube, Drone: 1 pro, Charger: Ev-peak, Battery, Telemetry radio: Holybro, GPS: Here 3 +, Parachute: MARS Mini v2

Defining the goals of the project:

- Deploy the parachute safely in a controlled environment.
- Comprehend and analyze the underlying code.
- Successfully deploy the parachute in-flight, ensuring the proper functioning of all system components.
- Confirm the compatibility of the parachute with the drone and ensure a safe landing.
- Ensure proper deployment of the parachute once an emergency state is detected, leading to a safe landing of the drone.

Summary and Conclusions:

- Successful coding and deployment of the servo and parachute were achieved in the laboratory experiment.
- Emergency landing conditions were defined, including verifying that the parachute is not beneficial beyond a certain altitude.
- Full tests were not conducted at the natural environment due to the unfolding security situation.
- Consider adding noise to alert the surrounding environment of the drone's emergency state.
- Manual deployment requires additional coding to stop the rotators before the parachute is deployed.