Challenges and Solution:

Challenges:

1. **Multiple Drones for Multiple Tasks:** Designing different drones for different tasks posed the difficulty of too much machinery and complexity in logistics.
2. **Single Heavy Drone:** Designing a single drone to solve all problems made the drone too heavy and decreased its flight time.

Solution:

To overcome these challenges, we decided to design different components for different types of tasks that can be attached or detached depending on the operation and the need.

Introducing the Team Skyline **Detachable Drone Kit**

Detachable Components:

1. The Delivery Box
2. The Surveillance Camera Kit
3. The Environment Sensing Kit

Team Skyline : The Ultimate Drone Kit

1. The Delivery Box

- Description: A detachable box that can carry items up to 200g for a flight time of 20 minutes.
- Specifications:
  - Weight: 150g
  - Volume: 15 x 8 x 8 cm
  - Control: Channel 5
  - Features: The carrying capacity can be increased by using a more capable drone.
- Use Cases:
  - Delivering medical supplies such as medication, blood samples, or emergency equipment to remote or disaster-affected areas.
  - Transporting essential items during emergencies where traditional delivery methods are impractical.

2. The Surveillance Camera Kit

- Description: Equipped with the Foxeer Predator 5 Mini FPV Camera and a video transmitter.
- Specifications:
  - Camera: Foxeer Predator 5 Mini FPV Camera
  - Function: Provides live feed processed with OpenCV to detect help gestures in adverse situations.
  - Applications: Used for surveillance and in disaster situations to identify survivors.
- Use Cases:
  - Monitoring large crowds or areas during events to ensure safety and security.
  - Conducting search and rescue missions by identifying trapped or stranded individuals in disaster zones.
  - Providing real-time surveillance in

areas affected by natural disasters or other emergencies

3. The Environment Sensing Kit

- Description: Contains various sensors such as humidity and gas sensors.
- Specifications:
  - Sensors Included: Humidity sensor, gas sensor, etc.
  - Function: Senses and reports environmental conditions.
  - Expandability: Freely expandable with easy integration of additional sensors and coding to the board using available free pins.
- Use Cases:
  - Monitoring environmental conditions in hazardous areas to ensure the safety of rescue teams and affected individuals.
  - Collecting data on environmental changes during natural disasters, such as floods or wildfires, to aid in disaster management.

Development Approach:

Hurdles Faced:

1. **Design Complexity:**
   - Challenge: Balancing the need for specialized functions without overburdening the drone.
   - Solution: Modular design with detachable components.
2. **Weight Management:**
   - **Challenge:** Keeping the drone light enough to maintain a reasonable flight time.
   - Solution: Optimizing the weight of each detachable component and ensuring compatibility with various drones.

Final Solution:

By dividing the drone into different parts, each designed for a specific task, we achieved a flexible and efficient solution. The detachable components ensure that the drone can be quickly adapted for various missions without the need for multiple drones, thus simplifying logistics and reducing costs.