

Students Names:

Abdulrahman Moafa (AE), Ziyad Albeshri (AE)
Naif Alzahrani (ISE), Saif Abunaji (ISE)
Osamah Alati (CS), Mshari Almasaod (ME).

Guardian Eye

Senior Design Project

Coach:
Dr. Yasser Almoghathawi



INTRODUCTION

Efficient Incident Response. Our cutting-edge solution prioritizes rapid incident capture, quick video documentation, and seamless communication with Najm. Elevate your security with Guardian Eye—a tool that values your time and well-being

PROBLEM STATEMENT

Using Drones to Minimize Traffic Jams Caused by the waiting time of the accident's investigator.

CONSTRAINTS

Time Limitation: 15 weeks.

Budget: 8000 SR.

Government Regulations: By Law drone must have permission to fly over the populated Areas.

Safety: Drone must be safe to fly above people.

TARGET SPECIFICATIONS

- The drone's speed should be $> 19\text{mph}$ and $< 87\text{mph}$.
- The drone's flight duration > 30 minutes.
- The drone's communication devices range > 6.5 miles.
- The camera resolution must be at least 1080p, 30fps.
- Weight $< 2.5\text{kg}$

PROJECT IMPACT

The Traffic Investigation Drone Project aims to revolutionize traffic management by deploying drones to investigate and film car accidents, reducing congestion and expediting the accident investigation process. By quickly capturing comprehensive aerial footage in areas with heavy traffic during rush hours, drones minimize delays and allow investigators to assess the scene remotely and efficiently.

PROTOTYPE DESIGN



Figure 1: Drone model

Prototype is divided into 6 parts:

- 1- Frame: HF 550 Hexacopter frame
- 2- Flight Controller: Pixhawk 2.4.8
- 3- Motor: SunnySky X2820
- 4- Battery: 10400mAh lipo
- 5- R12 Receiver – R12 Remote Controller
- 6 – Camera Gimbal – Camera



Figure 2: Physical prototype

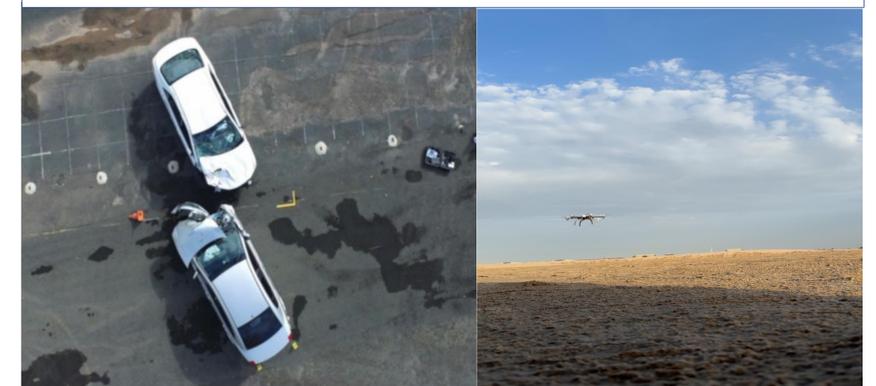
TESTING

The final specifications of the prototype:

- 1 – The drone meets the speed criteria.
- 2 – The flight duration reached 42minutes exceeded 30minutes.
- 3 – Camera Monitoring, the camera resolution is 1080p, also the camera gimbal moves along the y-axis.
- 4 – The drone weight is 2.26kg meeting the weight specified.

Looking at the final specifications, we can conclude that the prototype satisfies more than the preliminary specifications.

For the Communication range, 6.5miles is too much to test especially that we don't have the place to fly the drone freely.



CONCLUSION

In summary, The Guardian Eye is a high-quality camera-equipped drone designed to capture detailed photo evidence of car accidents. The drone's imagery is stored in specialized software, allowing investigators to analyze the footage and determine fault percentages for each party involved. By providing precise documentation, the Guardian Eye streamlines accident investigations and enhances the accuracy of fault assessment.