

**Paper Title:**

Developing Smart COVID-19 Social Distancing Surveillance Drone using YOLO

**Paper Link:**

<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9357040>

**1 Summary****1.1 Motivation**

This paper designs a smart social distancing surveillance system using a drone to identify violations of social distancing policy. The system utilizes YOLO-v3-tiny for fast object detection to identify people and crowds. The drone is equipped with global positioning system and frontal camera for localization and navigation. With this approach we can increase awareness and reduce the spread of covid or any contagious diseases.

**1.2 Contribution**

This paper presents a novel and innovative solution that leverages the power of YOLO (You Only Look Once) object detection technology to develop a Smart COVID-19 Social Distancing Surveillance Drone. This work makes several substantial contributions to the fields of computer vision, public health, and pandemic response.

**1.3 Methodology**

The proposed framework consists of object detection, drone agent, localization, navigation, and a social distancing system. The drone detects people and measures distance between them to identify social distancing violations. If distance is less than a threshold, a red warning box appears; if above the threshold, a green box appears.

**1.4 Conclusion**

Experiments were conducted in a simulated environment using ROS and Gazebo. The drone localized itself and followed roads using segmentation and contour tracking. People detection accuracy was above 90%. Social distancing warnings were generated based on calibrated real world distances. Crowd detection also worked accurately.

**2 Limitations****2.1 First Limitation**

This system was implemented using a robot operating system simulation environment. For this to work, it needs to be implemented on an actual drone

**2.2 Second Limitation**

As of now (2023), the latest version of Yolo is v8 whereas in this paper Yolo v3 was used. So later versions can be used to improve accuracy of the results

**3 Synthesis**

Future work involves implementing the system on a real drone, potentially adding thermal sensors for COVID-19 detection. Simultaneous localization and mapping could be added for unfamiliar environments. The simulations demonstrated an effective computer vision and control system for social distancing surveillance.