

## Task 1

**Paper Title:** Fire Detection and Notification Method in Ship Areas Using Deep Learning and Computer Vision Approaches.

### Paper

**Link:** <https://www.mdpi.com/1424-8220/23/16/7078#:~:text=It%20uses%20a%20special%20technique,many%20images%20for%20a%20dataset>.

**1 Summary:** . This research paper presents a fire detection technique based on YOLOv7 (You Only Look Once version 7), incorporating improved deep learning algorithms in ship area.

**1.1 Motivation:** Since 15th century shipping method use as a transport goods travelers, and the massive exchange of personnel and things has drastically affected the social and natural landscape. And also passenger and crew's life is dangerous because of transport flammable things (coil, oil etc). From the previous experiment fire incident is the most common incident in the ship area. For this reason the most popular OS projects in computer vision is used, named YOLO to real-time object detection algorithm which empower it to perform object detection more precisely and accurately

**1.2 Contribution:** In this research paper author reduce the risk of crew's and passenger life, finance problem and environmental pollution. Along with this improved and faster version of a fire detection system for ships using the YOLOv7 architecture. The author also ensure detecting real-time fires in maritime environments. To train this model total collected 4622 images of various ship scenarios and performed data augmentation techniques.

**1.3 Methodology:** First establish YOLOv7 and compare accuracy with other version of YOLO. And after that detect train datasets in YOLOv7 architecture.

**1.4 Conclusion:** The improved algorithm gives higher accuracy which is 97% among all the versions of this model and also detects fire in real time along with response time.

## 2 Limitations

**2.1 First Limitation:** It was observed during experimentation that some of the images containing fire-like objects were recognized as fire. If an image contains bright sunlight, intense yellowish red lights, or fire-like bulbs, then it will be detected as a fire

**2.2 Second Limitation:** This proposed system suffers in detecting fire smoke and lacks in detection of fire when there is a comparatively low level of ambient light.

**3 Synthesis:** This algorithm cannot detect in low or high red light moment. Future work should train more datasets to improve this section. Moreover smoke detection by the system can be added to expand the implementation areas of the model. Overall this update model can save incidents and life.

