



WEAPON DETECTION SYSTEM USING EFFICIENTDET

SUBJECT CODE: AD18711
SUBJECT NAME: MINI PROJECT

ABSTRACT

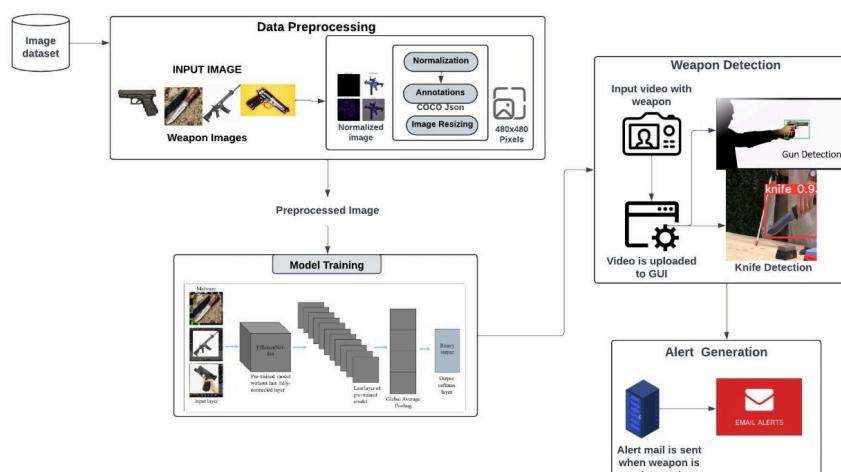
- Weapons in public spaces pose a serious security threat, and current detection systems are often inefficient.
- EfficientDet, a state-of-the-art object detection model, can be used for accurate weapon detection.
- Model training on a large dataset and the application of techniques like fine-tuning and non-maximum suppression significantly enhance accuracy.
- Integration of real-time processing ensures timely threat detection and response.
- Deploying the model on edge devices improves scalability and operational efficiency.

PROBLEM STATEMENT

- A weapon detection system leveraging the EfficientDet algorithm is proposed, trained on a robust dataset to achieve **high-accuracy** detection of various weapons.
- The system enhances **real-time detection** capabilities, enabling quicker and more reliable identification of potential threats.
- Designed for scalability, it integrates seamlessly into existing surveillance infrastructures, offering a practical solution to modern security challenges.
- By addressing limitations in current detection technologies, this approach significantly contributes to improve safety.

PROPOSED WORK

- A real-time weapon detection system is developed using EfficientDet, highlighting objects with **bounding boxes** and simulating neural activations with dynamic visualizations.



REQUIREMENTS SPECIFICATIONS

Hardware Requirements:

- Processor : 2 GHz dual-core processor
- RAM : 16 GB.
- Hard Disk : 512 GB.

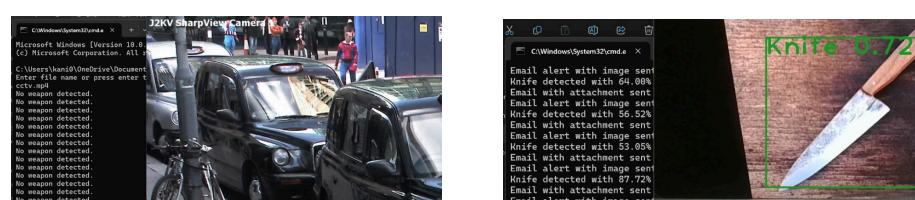
Software requirements:

- Windows OS
- Python.
- Jupyter.
- Tensorflow.
- Keras.

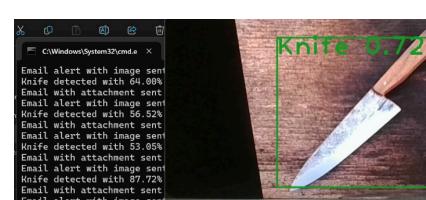
IMPLEMENTATION MODULES

- **Data Preprocessing:** Collect a balanced dataset of weapon and non-weapon images, remove corrupted samples, handle missing data, resize to 480x480 pixels, normalize pixel values, and convert annotations to **COCO JSON** format.
- **Weapon Detection:** EfficientDet with BiFPN ensures accurate, efficient **real-time detection** of weapons like **guns and knives** in user-uploaded videos, highlighting detected objects with bounding boxes and confidence scores.
- **Alert Generation:** Sends **email alerts** for detected weapons above the confidence threshold, with weapon type, time, and optional screenshots via **SMTP** for quick, reliable notifications.

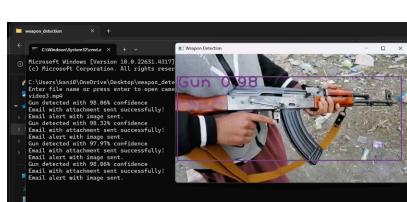
OUTPUT SCREENSHOT



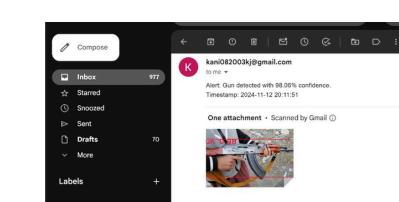
a. No weapons detected



b.Knife Detected



c.Gun detected



d. Alert generation.

INFERENCES

- **Real-Time Video Analysis:** The system processes video input in real time, identifying weapons like guns or knives to ensure prompt threat detection.
- **Weapon Detection:** EfficientDet with BiFPN detects weapons across frames, adapting to different scales and lighting for consistent performance.
- **Alert Generation:** The system triggers alerts with bounding boxes, confidence scores, and **email notifications** when a weapon is detected.
- **Output Delivery:** Detected weapons are highlighted in the video feed, enhancing real-time situational awareness.
- **Continuous Updates:** The model adapts to new data, improving detection accuracy and system reliability over time.

CONCLUSION AND FUTURE WORK

- Leverages EfficientDet for accurate, real-time weapon detection in video feeds, ensuring **efficiency and reliability**.
- Modular design integrates detection, alerting, and **continuous updates** for seamless and consistent performance.
- Provides instant alerts and real-time threat highlights, enhancing **situational awareness**.
- The system is optimized for deployment across various platforms, including mobile and edge devices.
- Future plans include expanding the dataset, **adding more weapon types**, and improving detection in challenging conditions like low light.

CONTRIBUTORS



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