WEBHEADS

ASTROX

Duality AI's Space Station Safety Object Detection

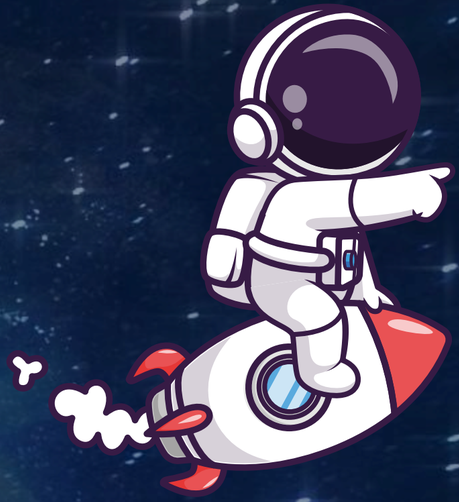
THE TEAM

WEBHEADS

Zaina Bilquis

Ruqayyah Zaheeruddin

Rehan Azeem



Mohammed Murtaza

THE PROBLEM

Every Second Counts in Space

- Emergencies like sparks, leaks, or fires can become lifethreatening in seconds
- Astronauts can't waste time searching for safety tools
- Our AI detects seven critical safety items instantly, even in low light or cluttered conditions
- .Ensures help is never out of sight, keeping the crew safe.

THE 7 TARGET OBJECTS

OXYGEN TANK

EMERGENCY PHONE

NITROGEN TANK

SAFETY SWITCH PANEL

FIRST AID BOX

FIRE EXTINGUISHER

FIRE ALARM

OUR APPROACH

Dataset Source:

- We used a synthetic dataset generated from Duality AI's Falcon Digital Twin simulation platform
- The dataset contains labeled images of seven essential safety items under various conditions such as low lighting, object occlusion, and different camera angles.

Model Used: YOLOv8

Environment & Tools:

- Training Environment: VSCode
- Core Framework: PyTorch
- Supporting Libraries: OpenCV, NumPy, Matplotlib for visualization

TECH STACK

Duality Ai

YOLOv8

OpenCV

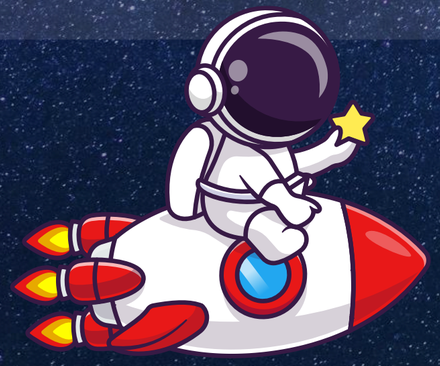
PyTorch

Matplotlib

Numpy

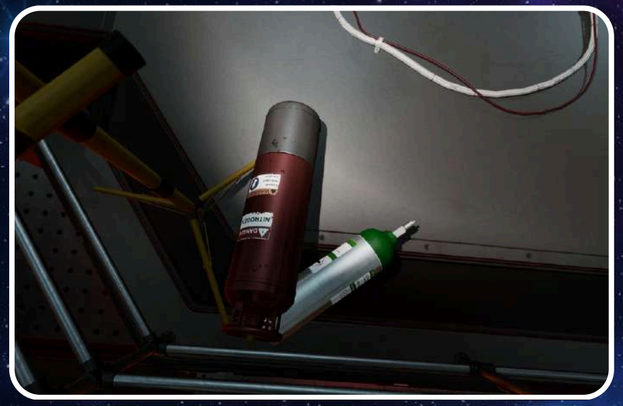
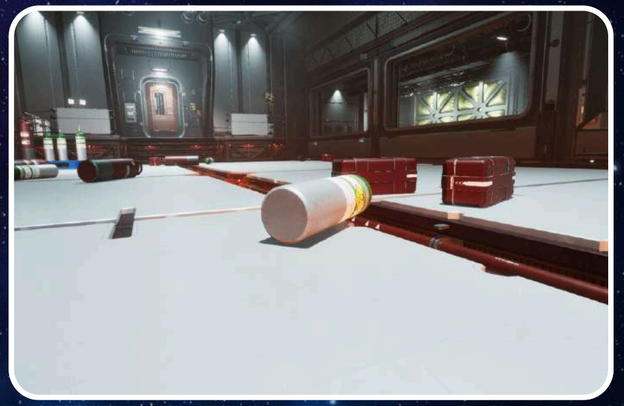
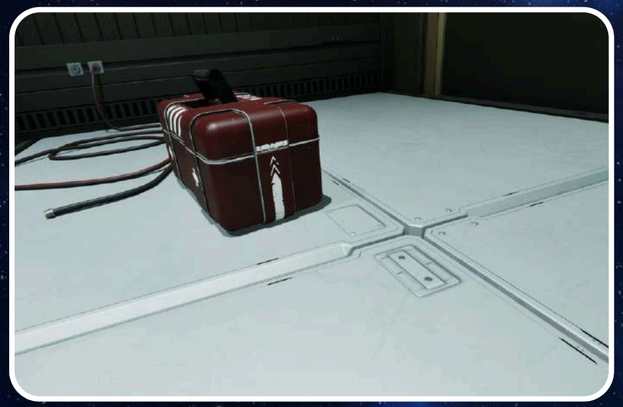
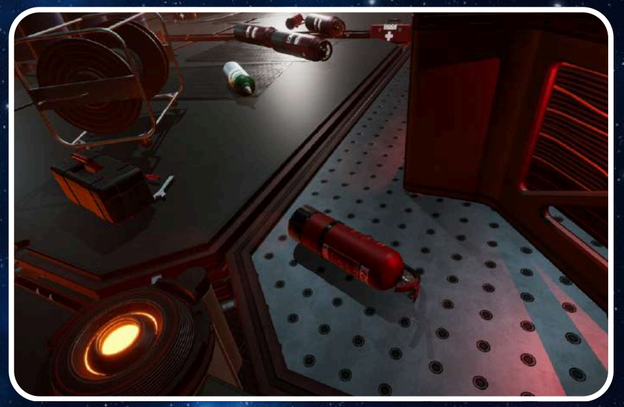
Dataset

Preprocessing



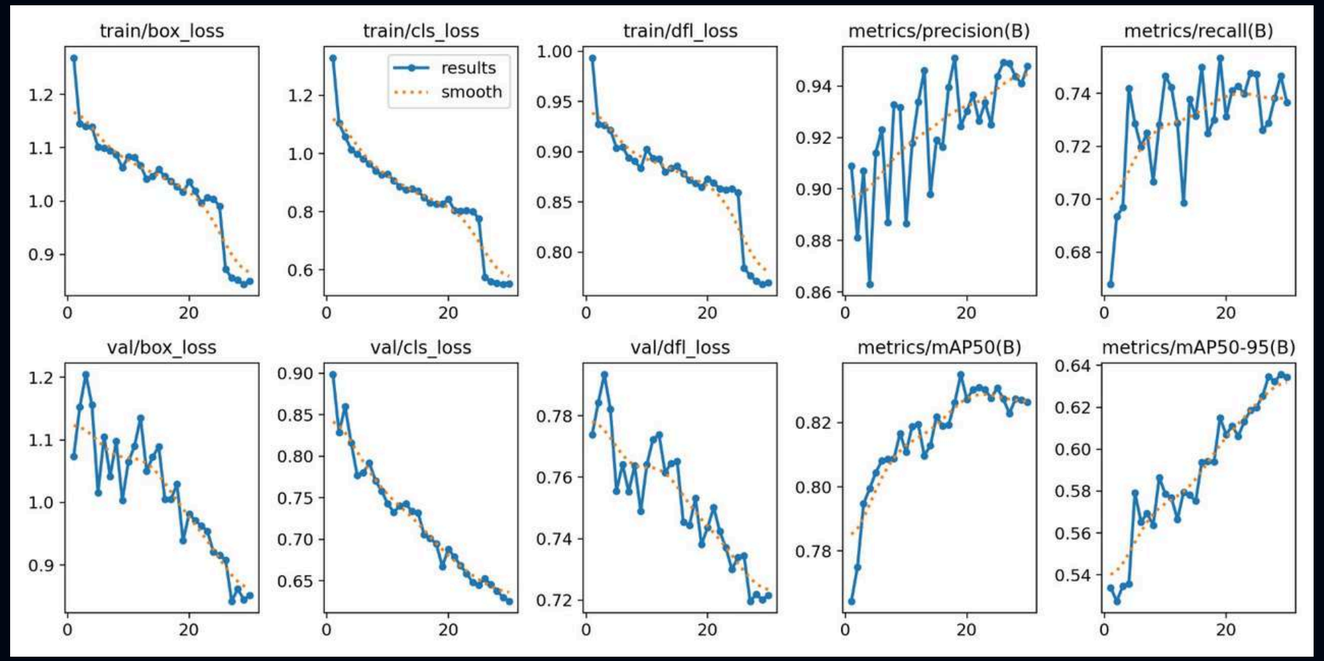
YOLOv8

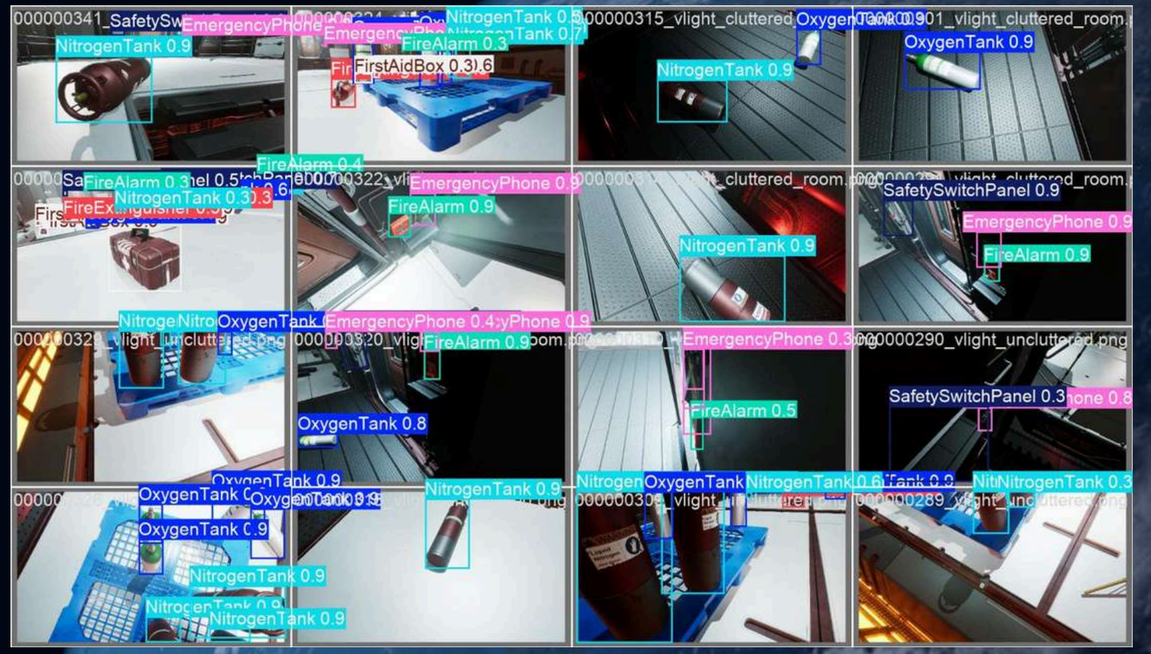
Detection Results

TRAIN	TEST	VAL
		
		
		

RESULTS

- mAP@0.5: 82.7%
- Precision: 94.13%
- Recall: 74.63%





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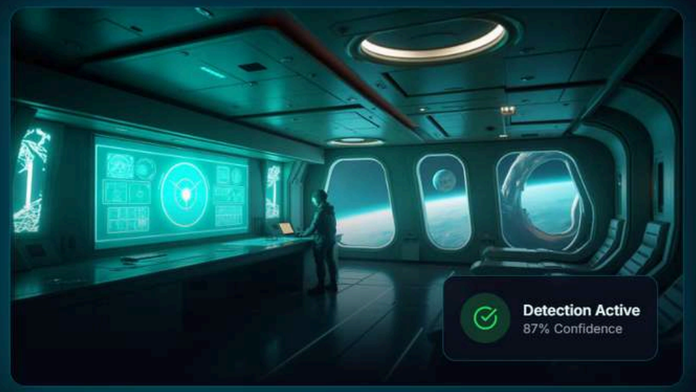


THANK
YOU