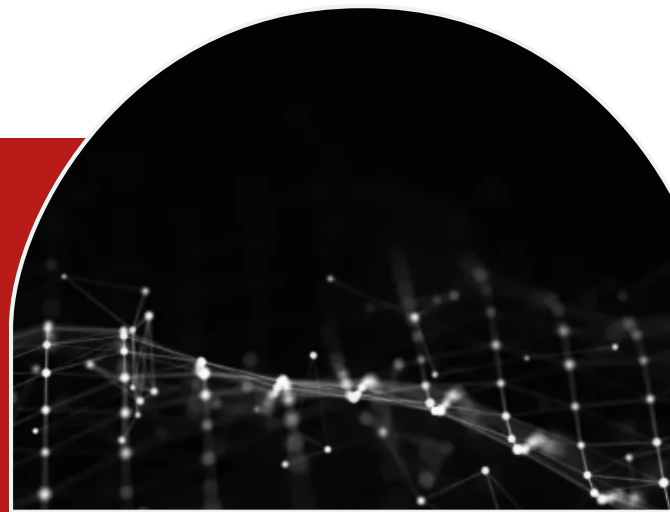# YEARLING AI

REAL-TIME VIDEO FEEDS ENHANCE AVIATION OPERATIONAL SAFETY

Stay Alert.
Stay Ahead.
Stay Secure.

INTRODUCTION

Ensuring the safety of aircraft and ground operations is essential for maintaining smooth and efficient airport logistics. This project utilizes advanced computer vision technology to analyze real-time video feeds from strategically placed cameras across key airport areas, including docking tunnels, bridges, moving vehicles, stairs, luggage belts, and other critical zones. By detecting potential safety hazards in real time, the AI-powered system generates immediate alerts, enabling ground crews to respond quickly and prevent incidents before they occur.

CUSTOMER STORY

A leading AeroTech solution provider, specializing in Ground Support Equipment and Gate Equipment, wanted to automate equipment movement and logistics during aircraft docking. Traditionally, these operations were managed manually, but the widespread presence of airport cameras presented an opportunity to leverage AI/ML for real-time safety monitoring.

The challenge was to develop an AI/ML solution that could detect safety-critical scenarios in real-time video feeds and generate alerts to prevent damage to equipment, aircraft, and personnel.

OUR SOLUTION

Use Case 1: Aircraft Door Safety
- Scenario: Aircraft docks at the airbridge, and the door opens.
- AI Actions: Detect key objects, measure distances, and alert if the door touches the safety shoe.
- Objective: Prevent door-floor contact.

Use Case 2: Airbridge-Engine Collision Avoidance
- Scenario: Aircraft docking and door opening.
- AI Actions: Track engine and airbridge movement, measure proximity, and issue alerts when too close.
- Objective: Prevent collisions.

Use Case 3: Stairway Safety
- Scenario: Movement of stairs for luggage and personnel access.
- AI Actions: Detect objects, track movement, and measure distances.
- Objective: Ensure safe stair and object movement.

KEY TECHNOLOGY & FRAMEWORK

Technology

- Object Detection: Bounding boxes to identify objects.
- Predicting Segmentation Masks: Assigning each pixel to a class.
- Depth Estimation:
- Monocular (single-camera-based)
- StereoVision (stereoscopic cameras capturing the same scene from different angles)
- Optical Flow Maps: Predicting pixel direction and magnitude across frames.
- Kalman Filters: Velocity estimation of moving objects.

Framework

- PyTorch-Lightning
- OpenCV
- Jupyter Notebooks
- FastAPI
- Optuna
- Kubeflow
- Google Cloud Platform

CUSTOMER BENEFITS

Our AI-driven solution enhances safety, reduces costs, and improves efficiency by:
- Preventing hazards and costly aircraft or equipment damage.
- Automating real-time monitoring for smoother operations.
- Enhancing safety for personnel and logistics.
- Reducing repair costs, delays, and disruptions

ABOUT YEARLING AI

We build AI that works. At YearlingAI, we bring deep technical expertise to solve complex problems with machine learning, natural language processing, and generative AI. From intelligent automation to custom LLM agents, we design, build, and deploy solutions that drive results. As a Google Cloud partner, we specialize in cloud-native development—but also support AWS, Azure, and hybrid environments. Whether you're a growing startup or a global team, we deliver practical AI solutions that scale with your needs.