Tecblic

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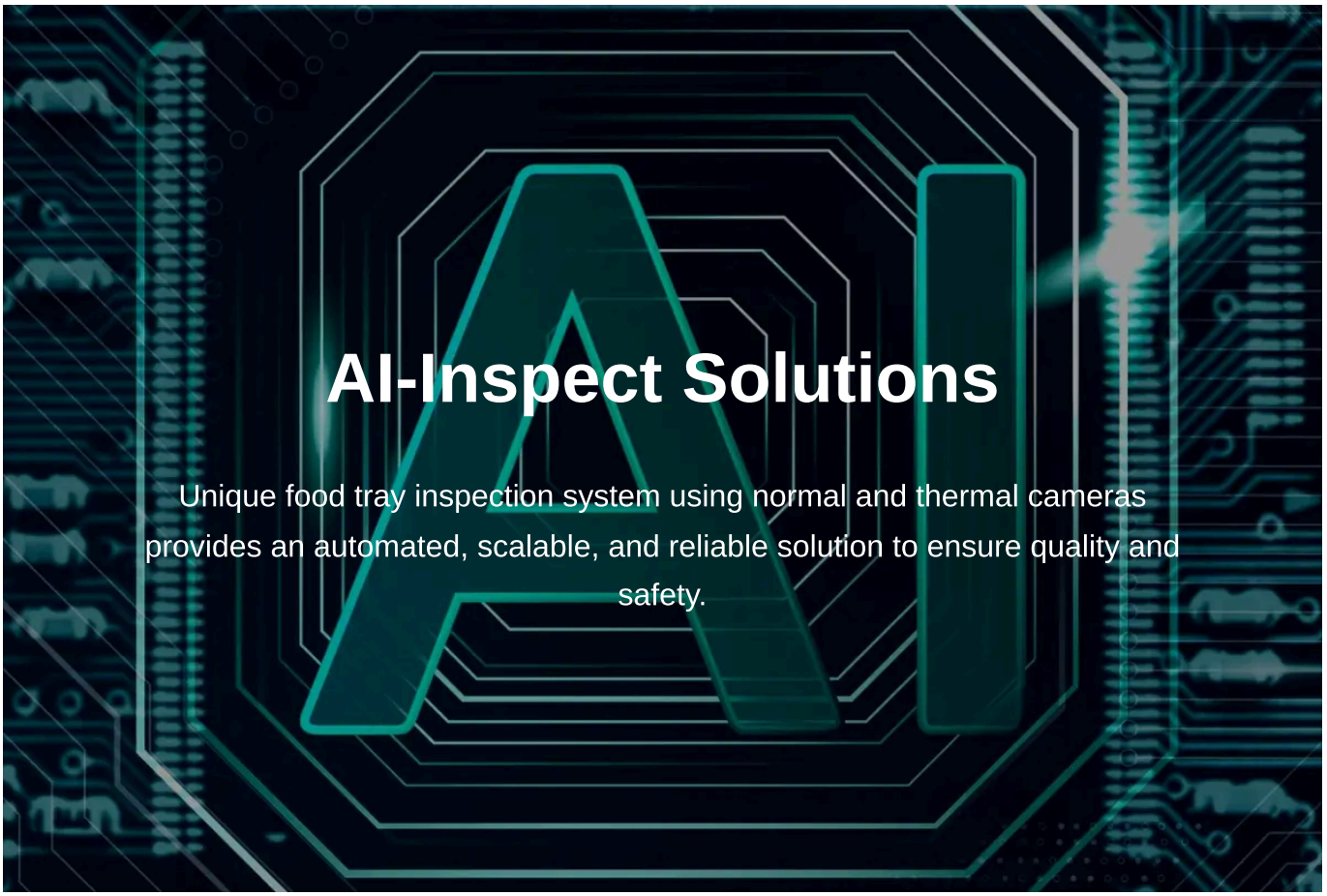

AI-Inspect Solutions

Background

Airline catering presents unique challenges due to the need for high-volume meal production, strict food safety regulations, and quality consistency. Airlines serve thousands of meals daily, and manual inspection of food trays is inefficient, prone to human error, and incapable of detecting certain food safety issues. An AI-powered food tray inspection system using normal and thermal cameras provides an automated, scalable, and reliable solution to ensure quality and safety.

Key Challenges

Airline catering kitchens operate under tight timelines, preparing and loading thousands of meals per flight. Manual inspection slows down production and risks delays in food delivery to aircraft. Human inspectors may overlook portion inconsistencies, missing items, or incorrect meal placements. Airlines must adhere to HACCP (Hazard Analysis and Critical Control Points),

FDA, and international aviation food safety standards. Any contaminated, undercooked, or incorrectly stored food could lead to passenger illnesses, legal issues, and reputational damage.

Our Solution

An AI-powered food tray inspection system utilizing normal and thermal cameras provides a fully automated approach to ensuring quality, accuracy, and safety in airline catering. Through visual inspection with normal cameras, the system can detect missing or misplaced food items, verify portion sizes for consistency, check packaging integrity, and identify foreign objects such as plastic, metal, or debris contamination. Additionally, thermal inspection ensures food safety by detecting cold spots in heated meals, verifying that frozen meals remain at safe temperatures before loading, and monitoring temperature consistency to prevent spoilage. With AI-driven real-time analysis, defective trays can be instantly flagged, reducing waste and ensuring only compliant meals reach passengers. Seamlessly integrating with conveyor belt systems, this solution enables high-speed, uninterrupted inspection, enhancing operational efficiency and food safety standards.

Tech Stack

Deep Learning Frameworks: PyTorch / TensorFlow for object detection and anomaly detection

FrontEnd, Backend & Data Processing: Python, ReactJS, NextJS, FastAPI, Azure Cloud Services

Computer Vision: OpenCV image preprocessing, segmentation, and feature extraction

Thermal Image Analysis: FLIR Thermography SDK / TensorFlow-based heatmap analysis

AI Model: YOLO / Faster R-CNN for object and defect detection

AI Optimization: TensorRT / ONNX for deploying models on edge devices

Cloud & Edge Computing: Fast and scalable content delivery

Value Delivered

Adherence to HACCP regulations

Enhance food safety and quality control while meeting regulatory requirements.

Reduce human error and inspection time, improving efficiency.

Ensure consistent meal preparation, leading to better passenger experiences.

Minimize food waste by rejecting defective trays early in the process.