



Overview

Airports manage thousands of baggage items per hour across complex conveyor systems. Ensuring uninterrupted baggage flow, rapid anomaly detection, and operational transparency is critical to minimizing delays, reducing losses, and improving passenger satisfaction. Traditional baggage monitoring solutions rely heavily on manual supervision, basic sensors, or centralized video analytics. These approaches lack real-time intelligence, are costly to scale, and often fail to respond quickly to operational disruptions.

Challenges

Limited Real-Time Visibility

- Conveyor systems span long distances with multiple blind spots
- Operators lack immediate awareness of jams, pile-ups, or abnormal flow

High Labor Dependence

- Manual monitoring requires continuous human oversight
- Delayed reaction times increase operational risk and baggage delays

Latency & Infrastructure Constraints

- Centralized or cloud-based video analytics introduce latency
- High bandwidth consumption increases operational costs

Harsh Deployment Environments

- Baggage handling areas demand 24/7 operation
- Exposure to vibration, dust, temperature variation, and limited space

Solution

The joint solution integrates DeepX and MemryX with the ARBOR industrial edge AI computing platform (ARES-1983H-AI). This enables real-time baggage monitoring and event detection directly at the edge. The solution combines the following:

- ARBOR provides an industrial-grade edge AI platform that enables reliable 24/7 deployment in space-constrained, maintenance-free, and harsh baggage-handling environments
- DeepX advanced computer vision analytics
- MemryX enables high-performance, high-accuracy AI inference at the edge through its MX3 M.2 AI Accelerator Module and an easy-to-use, public SDK to simplify deployment

How It Works

- Cameras installed at key handling checkpoints capture baggage images, barcode data, and movement status across the conveyor workflow
- DeepX AI models analyze baggage flow in real time to detect jams, pile-ups, congestion, and other anomalies during transport and handling
- ARBOR's ARES-1983H-AI edge AI platform, integrated with the MemryX MX3 M.2 AI Accelerator Module, processes inference locally to reduce latency and network load
- Baggage data is synchronized with cloud records to build a continuous tracking history from check-in and screening to dispatch, flight transfer, destination arrival, and final baggage carousel delivery
- Visual dashboards and real-time alerts help operators quickly identify baggage location, flow issues, and exceptions for faster intervention



Benefits

Real-Time Edge AI Processing

- Detects baggage flow disruptions, jams, pile-ups, and anomalies in real time at key handling checkpoints, while providing visibility into baggage location across the handling workflow
- Processes inference locally on the ARBOR edge AI platform to reduce latency and network load

Reliable AI-Based Detection

- DeepX AI software provides baggage detection and flow analytics, while the MemryX MX3 M.2 AI Accelerator Module enables efficient local inference on the ARBOR edge platform
- Maintains dependable performance in crowded, fast-moving baggage handling environments

Industrial-Grade Reliability

- ARBOR ARES-1983H-AI is fanless, rugged, maintenance-free, and designed for 24/7 operation in demanding airport environments
- Delivers stable performance in vibration-prone, space-constrained, and mission-critical baggage handling areas

Scalable Visibility and System Expansion

- Supports deployment across multiple conveyor lines, handling zones, or terminals
- Enables future expansion with AI model upgrades, cloud-connected tracking, and broader system integration

Contact our team of experts today to learn how the ARES-1983H-AI can revolutionize your project.

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