Solution Brief

Convenience Stores, Supermarkets, Shopping Malls

WINTEC Reduces Self-Checkout Shrink with AI-Powered SelfPOS60

Use of computer vision, commodity recognition and action recognition in SelfPOS60 helps detect thievery; POS system uses Intel® Core™ processors and OpenVINO™ Toolkit for AI performance

The COVID-19 pandemic marked a turning point in consumer use of grocery self-check-out. According to research by CapitalOne, the amount of sales coming from self-checkout will total $5.43 billion in 2030 nearly double the $2.63 billion in sales in 2025.[1]

Also increasing in that time span is inventory shrink from the malicious and non-malicious use of self-checkout systems. This includes customers not scanning items, misrepresenting products, switching barcodes, and walking away with unpaid for items, among others.

Retailers have tried to reduce these losses through a variety of means, including:

- Technologies such as video and weight checking
- Radio tag-based electronic article surveillance systems
- Training and the use of security teams
- Store design including the use of corrals and exit controls
- Processes such as extra staffing or closing self-checkout machines at certain times

But AI brings new possibilities to detect and reduce self-checkout-based shrink by combining AI-controlled cameras with commodity recognition and action recognition. Commodity recognition uses machine learning (ML), natural language processing (NLP), and computer vision to identify, classify, and analyze actual grocery items. Action recognition uses computer vision to identify and classify human actions in videos providing the ability to recognize a sequence of movements.

To help retailers improve self-checkout customer experience and reduce shrink, WINTEC, an Intel® Industry Solutions Builders Partner, has developed the SelfPOS60 point-of-sale system. The SelfPOS60 comes with advanced AI-powered cameras, IoT, AI and big data technologies. The system uses the AI processing power of Intel® Core™ processors and optimizes model performance with OpenVINO™ Toolkit.

An All-in-One Point-of-Sale System

The SelfPOS60 (see Figure 1) is an all-in-one AI POS system that features a 21.5" display, 80 mm printer, 2D barcode scanner, security scale and two speakers. The printer and scanner have a modular design. The system can be further customized with magnetic stripe readers, PIN pads, and other peripherals through the built-in USB, RS232, Ethernet, HDMI and other connectors. Bluetooth and Wi-Fi connections are also supported. The system can be installed on a desktop, wall, pole stand or cabinet and comes with a three-color light that makes it easy to alert staff when help is needed.

Figure 1. WINTEC SelfPOS60 configured with bagging station and security scale.

The system supports existing electronic article surveillance (EAS) theft-prevention systems that detect items that pass through a checkpoint based on the status of a radio frequency (RF) or acousto-magnetic (AM) tags or antenna.

AI-Based Loss Prevention Functionality

For AI-based loss prevention, the SelfPOS60, can be equipped with a 3D camera and computer vision capability that can process video streams in real-time to enhance loss prevention, making self-checkout processing rapid and secure.

This loss prevention capability operates by continuously analyzing video footage of the checkout process captured by the cameras and cross-referencing this visual data with the transaction log of scanned items. This enables the system to intelligently monitor and assess customer actions during self-checkout, automatically identifying anomalies or high-risk behaviors and triggering real-time alerts for staff intervention, thereby significantly mitigating loss.

The AI camera cross-references video and transaction data in real-time to catch scanning errors or avoidance. Staff are freed for improving customer service or other higher-value tasks. It also provides valuable data insights for operational optimization.

As seen in Fig. 2, video from the 3D camera is processed initially by the WINTEC loss prevention software development kit (SDK). If a risky behavior is detected, a risk message is sent to the loss prevention software. At the same time, input from the scanner is also continuously processed by the loss prevention software.

The AI loss prevention system carefully considers the camera's shooting angles and coverage. During the checkout process, the cameras only capture the actions of customers scanning items on the pallet. In the event that a customer enters into the camera's range, the system does not process any facial or personal images, safeguarding customer privacy.

When a problem is detected, a control signal is sent from the loss prevention software to the warning lamp alerting store personnel. At the same time the risk log, video and scanning information goes to the cloud-based loss-proof system for further analysis.

Compute Performance from Intel

The SelfPOS60 offers high compute performance for multi-core processing and control decision based on Intel Core processors and model acceleration using OpenVINO toolkit.

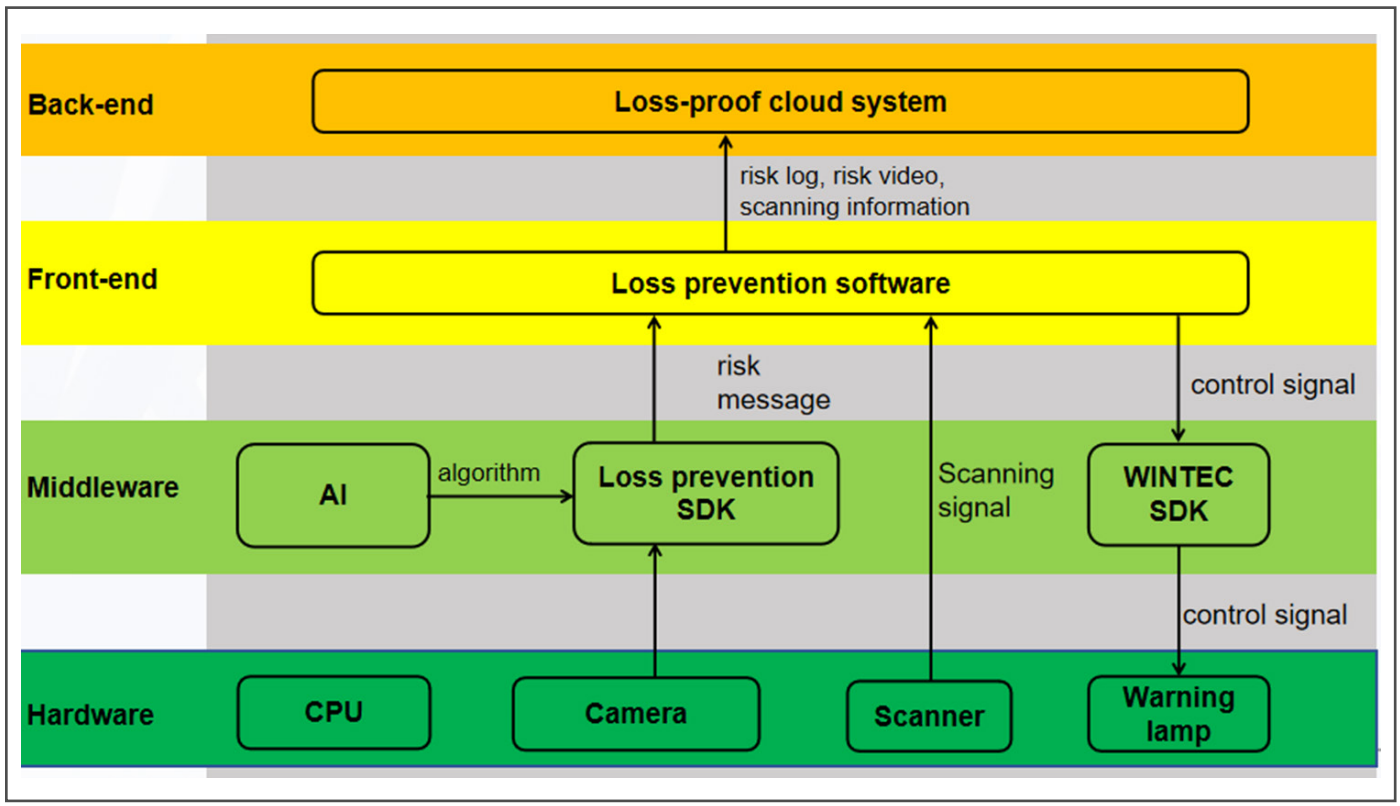

Figure 2. WINTEC AI loss prevention algorithm.

The SelfPOS60 is powered by one of two Intel Core processors:

- Intel® Core™ i3-1115G4 processor two-core CPU running at up to 4.1 GHz with 6M cache
- Intel® Core™ i5-1135G7 processor four-core CPU running at up to 4.2 GHz with 8M cache

Intel Core processors integrate multi-core architectures, enabling simultaneous execution of multiple tasks, which significantly enhances performance. Intel Core processors are also distinguished by support for AI acceleration for responsive computing experiences. Intel Core processors support fast DDR4 memory.

OpenVINO™ Toolkit

To help process the computer vision functionality in the SelfPOS60, WINTEC uses the OpenVINO toolkit. This software enables AI model optimization across multiple frameworks, and hardware abstractions, and features performance tuning for Intel® processors.

OpenVINO toolkit accelerates AI inference to boost generative AI performance on Intel hardware. In the SelfPOS60 system, OpenVINO toolkit is used for a range of computer vision processing functions that allow the operation of the SelfPOS60 system to be customized for a number of use cases.

This integration ensures real-time, reliable computer vision performance, helping retailers deliver faster transactions, reduce errors, and adapt the system to different store environments.

Conclusion

Grocery store self-checkout utilization is growing. But so is the theft that is made easier without store personnel managing the checkout process. The SelfPOS60 from WINTEC is bringing AI features to stores to provide a new tool to detect problematic behavior and reduce the shrink that is associated with self-checkout. For AI processing performance, including real-time computer vision, WINTEC has based the system on the several devices in the Intel Core™ processor family. OpenVINO toolkit was also used in the system to accelerate the AI inferencing.

Learn More

WINTEC Home Page

SelfPOS60 Product Page

Intel® Core™ Processor Product Page

OpenVINO™ Toolkit

Intel® Industry Solutions Builders

[1] https://capitaloneshopping.com/research/self-checkout-statistics/

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