

THWARTING RETAIL THEFT USING AI TECHNOLOGIES

WHITE PAPER

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Combating retail theft has always been a challenge and remains so today. A <u>recent</u> <u>article</u> in the Wall Street Journal claims that as much at \$94.5B was lost nationwide to "shrink", aka shoplifting, in 2021 alone.

Retailers often resign themselves to accept a certain amount of it as a cost of doing business, which eventually gets passed on to the consumer. But in parallel with the rise of new retail experiences that are increasingly cashless and contactless, incidences of in-store theft are also rising. However, this is changing with the aid of new AI acceleration technologies and techniques that can isolate, identify, monitor, and alert retail organizations to theft problems. And retail vendors are already realizing the benefits.

Historically, plain-clothes officers and video surveillance have been the classic deterrents to inventory shrinkage linked to employee theft or shoplifting, which according to a <u>National Retail Security Survey</u> reached an all-time high in 2021. The same study found that most retailers surveyed reported that incidents of in-store, ecommerce, and omnichannel fraud had risen, and that organized retail crime – violent incidents in particular – are increasing.

Perhaps surprisingly, new technologies such as self-checkouts designed to make the shopping experience faster and easier have in some instances also made theft easier, as those with criminal intent devise new ways to bypass or subvert existing systems. It doesn't help that criminal prosecution penalties have become almost meaningless, but that's the subject of a very different and complex article.

Retailers are fighting back by heavily investing in "smart" technology that can quickly and accurately identify incidences of subtle fraud to blatant theft. Fully half of the respondents to the 2021 survey confirmed that their organization was adding technical resources to combat theft of every type.



Figure 1.

New technologies sush as self-checkouts have increased the incidences of theft



A large part of this theft detection is driven by the deployment of a new generation of smart cameras and Edge appliances containing cost-effective AI processors that can be coupled with computer vision to more closely - and intelligently - scrutinize checkout transactions as well as in-store behaviour that may be deemed suspect.

Al used for such applications serve multiple purposes by not only authorizing cashless/contactless transactions faster, but by providing useful insights about customer preferences, behaviour, and spending to create an even more tailored shopping experience for them in the future. It can also greatly improve inventory control and management as well as forecast stock requirements or model the potential effect of supply chain delays resulting from global market disruptions.

Furthermore, the application of such technology is not limited to matching the type and number of items placed in a bag at a checkout to the type and number of items scanned, or employees who are providing discounts or freebies by stealth to friends or colleagues in retail situations. The same anti-theft processes apply to those wishing to protect valuable assets in, for example, healthcare facilities, office buildings, and sensitive infrastructure sectors.

The immediate problem of inventory shrinkage due to theft and fraud in these areas must be resolved. To achieve that, AI systems are rapidly becoming hyper-intelligent and operate best where they are needed most, at the Edge. What that means is that data can be collected, analyzed, and if necessary, actioned, where it happens locally to thwart criminal intent. This is enabled by new and faster processing technologies that run on high-performance Edge AI systems that are tailor-made to scan products and identify people.

Such AI-driven systems can be positioned near every checkout stand, but are increasingly being deployed throughout a store, working with coordinated precision with other Edge devices in the system to track not only line items, but those who consider, purchase, or replace (in most cases) an item.



Figure 2.

Edge AI Technologies can be used to detect instances of shoplifting by identifying the objects being scanned and checked out.



The choices for AI devices that purport to provide these anti-theft benefits are increasing, but so far only a handful of manufacturers and developers truly understand the technical requirements needed to make such devices cost effective, yet powerful enough to process data swiftly and intelligently to levels that are an effective barrier to theft.

Rapid advances in – and the acceptance of – AI and Edge technologies mean that such AI processors, sensing devices, and the applications that run on them are emerging around the world, where many new-style "frictionless" (i.e., no contact) retail stores are being established. The concurrent growth of AI technology used at the Edge in those retail outlets to address the threat of profitability being negatively impacted by theft that could be intercepted and, in many cases, prevented entirely is similarly gaining strength.

The result of new AI technology sweeping the retail market is helping to usher in a new era in security as retail vendors and on-site managers become increasingly aware that processing technologies are now available to power AI software platforms that can easily outsmart criminals.

Competition for retail dollars will remain fierce, as it should, but mitigating unfair competition from those who would defraud, deceive, or destroy makes it a fair and honest fight for retailers to protect and benefit their legitimate customers.

Continuing to couple AI technology at the Edge might mean that such subversion could soon be practically impossible.

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