SOLUTION BRIEF

AI Machine Vision
Luxury Retail

intel®

WonderStore Creates Smart Brand Detection for Deeper Customer Insights

Real-time customer insights with brand recognition powered by the Intel® Distribution of OpenVINO™ toolkit

wonderstore
The Value of Others

"WonderStore uses Intel® DevCloud for the Edge to train models with data sets of over 30,000 pictures in half the time vs. on-premise servers.[1] Intel® DevCloud for the Edge allows us to choose our hardware configuration to optimize training, enabling us to create vertical CV models for each customer's needs."

—Reinier van Kleij, CTO, WonderStore

16%↑
improvement in shop-window conversion for existing customers[1]

Responsive retail for a relevant customer experience

Staying competitive in fashion retail requires outstanding customer experience for demanding consumer segments. Understanding customers—what they're wearing and how they interact with the retail environment—is key to increasing buy conversion. Now, WonderStore, powered by Intel® technologies, allows retailers to collect more data than ever about their customers, with a 16 percent improvement in shop-window conversion for existing customers.[1]

The new WonderStore Brand Detector, optimized with the Intel® Distribution of OpenVINO™ toolkit and Intel® DevCloud for the Edge, identifies the type and brand of clothing being worn by shoppers. The solution automates brand identification, using visual sensors directed at shop windows, entrances, and store shelves. Using WonderStore Brand Detector, luxury retailers can better understand what customers are wearing and where they spend time in the store, then offer them relevant recommendations based on existing preferences.

Challenges: Brand identification training and visual recognition frame rates

Identifying clothing type and brand on a consistent basis offers several challenges for retailers seeking an automated solution. The first is that customers may be wearing any of a large number of clothing brands, and it is often difficult to obtain catalog content images. Even when these images can be sourced, they must be regularly updated as new products are released. Visual identification represents a compute challenge: high frame rates improve the accuracy of automated sentiment and clothing brand analysis, but maintaining them can create a high computational burden.

In addition to in-store challenges, developers face a time-consuming process to first create effective deep learning prototype models, then optimize those models for maximum performance. However, developing and iterating quickly on these models can offer a significant competitive advantage for retailers, who can use them to gain deeper insights about each customer in or around their storefront.

Solution: Optimized brand recognition for improved store performance

WonderStore gathers data from cameras located throughout the store, in addition to those in shop windows. Using computer vision algorithms and artificial intelligence trained on models from the Intel Distribution of OpenVINO toolkit, customer data is analyzed, aggregated, and anonymized before being sent to the cloud.

◉ OpenVINO™

In real time, the results of this analysis are used to power a range of smart shopping experiences in store, as well as communicate data with sales associates and retail marketing teams. This enables rapid A/B testing of shop windows or in-store displays, as well as development of visitor personas to increase revenue and improve targeting.

WonderStore enables streaming content, personalized by visitor segment, to be pushed to store displays. This creates a dynamic, interactive space that adapts to fit target customers. With sentiment analysis and dwell-time monitoring, stores can better understand which displays are making customers happy—and which brands are being worn by the customers who are responding best.

Using advanced computer vision technology, WonderStore can use a previously submitted series of opt-in selfies of a shopper (from sources like social media drawings, customer reward programs, or email marketing contests) to identify the shopper in store and determine which online marketing campaigns are generating results at the retail level.

Benefits of WonderStore's audience measurement and brand recognition include:

- **Improved shop window conversion rate:** WonderStore helps turn curious shoppers into customers, increasing the shop window conversion rate by 16.7 percent by helping retailers better understand which customers are looking at their window displays and for how long.[1]

- **Optimized personnel management:** Personnel and workloads can be managed in a data-driven way, with actionable insights about visitor flow, segmented by type of visitor, on a daily and hourly basis.

- **Customized customer interaction:** Using visitor segmentation and real-time profile KPIs plus analytics, interaction with customers can be made smart, with relevant messages, music, and even temperature and lighting optimized to drive maximum sales to the target customer.

- **Omnichannel experiences:** Enriching customer data with external applications makes it possible to improve email targeting and social media engagement efforts with in-store customers for a seamless transition between responsive retail stores and personalized marketing.

Use cases: The retail store of the future, today

With real-time recommendations that enhance the shopping experience, plus in-depth analysis and deep customer insights to enable data-driven retail strategy, WonderStore can create a smart store that truly knows its customers. The complete WonderStore smart store platform enables a wide range of use cases to create a responsive, relevant luxury retail experience, including:

Intelligent digital signage
Learn how many visitors and which visitor types stay close to or in front of digital displays, with full analysis of clothing type and brand, dwell time, and sentiment, all while streaming content relevant to them.

Visitor insight
Better understand what types of visitors enter the store, as well as their daily and hourly use patterns and where they spend the most time once inside the store, for improved performance of each store area.

Loyalty Cardless service
After a customer takes a series of selfies in the WonderStore Loyalty mobile app, using their smartphone's standard procedure to train for unlocking with the user's face, WonderStore can activate the Loyalty Cardless service, recognizing the customer on sight with no card needed.

Immersive mirror
This semitransparent mirror with a high-intensity display behind it recognizes the clothing a store visitor has tried on and can use clothing information and other KPIs to make targeted recommendations to the customer in real time.

How it works in brief

To reduce training times associated with developing deep learning models, WonderStore tapped into the deep ecosystem of Intel technologies. Using Intel DevCloud, WonderStore reduced training times 50 percent compared to on-premises servers.[1] WonderStore leveraged the pretrained deep learning models included with the Intel Distribution of OpenVINO toolkit to rapidly improve the quality and performance of its visual recognition features, like its head pose model.

Using Intel DevCloud for the Edge, WonderStore allows developers to use their preferred framework for deep learning, then easily convert the models to run in production without code changes. Developers can rapidly iterate on new models for inference from video or images, with scalable storage that easily accommodates large data sets, and leverage pretrained models to quickly develop new solutions, like the Brand Detector, on top of existing ones.

WonderStore built its solution with efficiency in mind. Optimizing deep learning models with the Intel Distribution of OpenVINO toolkit made it possible for WonderStore to run these and other models concurrently on an entry-level Intel® NUC with an Intel® Core™ i3 processor, 16 GB of RAM, Intel® HD Graphics GPU, Intel® Movidius™ Myriad™ X VPU, and a 128 GB SSD. To maintain an up-to-date catalog of brand images for brand recognition training, image files were automatically scraped from brand e-commerce sites, but in the future, high-resolution images will be supplied by the brands.

Using the toolkit also enabled WonderStore to transition from using a CPU-based algorithm for its visual recognition and head pose extraction model to using a GPU-based algorithm running on low-cost Intel HD Graphics. With an economical PC profile and little programming effort, this simple change enabled a dramatic performance boost: from an average of 15 fps with CPU processing to 60 to 65 fps using the parallel processing power of the integrated GPU.[1]

Conclusion: Microtargeted retail made possible by Intel technology optimized for deep learning

WonderStore created a GDPR-compliant smart store platform that uses the power of computer vision to segment visitors and better understand their behavior. Powered by Intel® processors, Intel HD Graphics, Intel® VPUs, the Intel Distribution of OpenVINO toolkit, and Intel DevCloud for the Edge, the WonderStore platform offers luxury fashion retailers a new way to see customer interaction and purchases.

WonderStore uses in-store visual sensors and real-time analysis to customize store experiences based on customers' fashion choices, sentiment, and dwell time. Retailers can also make more-effective decisions about store displays, promotions, marketing campaigns, and personnel scheduling, using predictive analytics to guide a hypersegmented, data-driven retail strategy.

Learn more

To discover how the WonderStore smart store platform can drive more-precise customer segment and retail store insights, visit **wonderstore.ai** today.

About WonderStore

WonderStore is an Italian luxury computer vision boutique leveraging the Intel® Distribution of OpenVINO™ toolkit for acceleration of CV models on Intel®-based hardware in order to provide in-store analytics of shopper profiles with attributes like like dwell time and brands of clothing and accessories.

The WonderStore computer vision service helps brick-and-mortar retailers better understand their customers' desires and anticipate shopper behavior. The service combines hardware and software components with an intuitive business intelligence dashboard that helps visualize profiles of store visitors, including emotions, clothing brands, and shopper flow.

"Because WonderStore creates specific CV models for specific customers, we need OpenVINO™ to be able to run many models smoothly, using affordable hardware. By leveraging a huge repository of publicly available models for the CV developer community offered by the toolkit, WonderStore can provide in-store analytics and detailed shopper profiles—not just gender and age, but also which clothing and accessory brands they wear."

—Reinier van Kleij, CTO, WonderStore