Case Study

Retail Operations

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Simbe Robotics and Tally: In-store retail automation

Intel® RealSense™ Computer Vision Technology helps Simbe Robotics automate in-store retail operations.

Brad Bogolea, Simbe CEO

"Intel RealSense offers a seamless out-of-the-box experience with one of the most reliable multi-camera systems on the market, an important factor in our decision to work with Intel."

simbe

At a Glance

Challenge

One of the biggest blind spots in retail is in-store operations. In brick-and-mortar retail, inventory must be tracked manually by store associates, and analytic data is limited to tracking the sales at the register. Retail operations haven't changed much over time, leaving businesses looking for ways to take advantage of new technology to improve their bottom line.

Solution

Simbe was founded in 2014 to address these challenges by using robotics and analytics to provide retailers with an automated solution. Tally captures real-time inventory and e-commerce grade insights to allow retailers to optimize their in-store operations.

Results

Tally is an autonomous inventory robot designed to provide retailers with accurate real-time shelf data. It efficiently tracks shelf inventory and issues such as out-of-stock items, pricing changes and mistakes, and misplaced merchandise. Auditing around 10,000 items in 30 minutes, Tally empowers retailers and store associates with up-to-date information and shelf insights. Stores using tally experience a 2.2% uptake in sales due to optimized store execution and superior customer satisfaction.

Challenge

E-commerce is growing by 15 to 20 percent per year around the world, in part because of its ability to capitalize on analytics and identify new customer habits. Traditional retail stores do not typically have access to the same breadth of data. Additionally, the current most effective method of taking inventory requires store associates to perform inventory checks manually.

Retailers face challenges such as managing out-of-stock items in real-time or near real-time. A customer cannot buy an item that isn't on the shelf, so even though that item may be available in-store, without an associate noticing the empty shelf space and restocking, item sales can easily be missed. Tally detects ten times the amount of out of stock items compared with a manual inventory check.

Another issue faced by in-person retail is pricing and promotion execution. Ensuring the shelf has the right and accurate price displayed near the correct items at all times is tedious, and a place where mistakes can cost retailers significantly over time. Item placement is also subject to 'plan-o-gram' compliance, which ensures that items are placed on the shelf in the correct place based

on promotions, seasonality, or store agreements with manufacturers.

Efficiently managing all of the above is complex, time consuming, and tedious for store associates, who could be better utilized spending time with customers and performing more fulfilling tasks. Together, these issues represent more than $1 trillion of missed sales annually for global retailers.

Solution

Tally, Simbe's robot, is the market leader in retail robotics, and the only fully autonomous robot in the industry able to traverse a store multiple times a day and connect to its charging base without the help of a store employee.

"Intel RealSense Cameras were the best option for Simbe's robot, Tally, for multiple reasons – they allow the robot to see the front and back of the shelf and allow this visual representation to be performed while Tally is moving. Holding still isn't an option for Tally." - Mirza Shah, Simbe CTO

Navigating store aisles, Tally scans shelves and analyzes inventory in real time by combining both computer vision and RFID technology to allow it to capture data in various retail environments, from boxes of pasta to soft-tagged items like clothing. Designed to be shy and unobtrusive, Tally can operate alongside shoppers and store associates during regular business hours.

Operating under Simbe's "Robotics as a Service" model, Tally is cost-efficient for retailers to deploy and scale to meet their specific needs. Rather than being a machine designed to automate jobs, Tally is a power tool in the hands of associates, freeing their time up for other tasks like directly assisting customers.

On the technical front, Tally easily integrates into an existing API, which seamlessly adds Tally's data into store operations through Simbe's cloud platform. Tally uses multiple Intel RealSense depth cameras to serve as the robot's eyes. The cameras provide depth data that Tally uses to map shelves, identifying holes that signify out-of-stock items. Additionally, with multiple Intel RealSense depth cameras placed around the robot, Tally can be aware of any obstacles in its path, such as grocery carts, displays or shoppers, and navigate around them safely. It allows Tally to avoid crowded areas and always give customers the right of way.

Simbe chose to work with Intel RealSense depth cameras for multiple reasons. Other cameras can have difficulty distinguishing between an object and the back of a shelving fixture, whereas using the (D435) helps Tally to see both the front and the back of the shelf and have a better understanding of what products are actually present. Additionally, since Tally has an entire store to scan, it was crucial that this analysis could be performed while Tally is moving. Remaining stationary would waste a significant amount of time, so the fact that the depth cameras can perform this visual representation in color and in motion was an important factor in determining the right sensors for the robot.

A final factor in selecting the Intel RealSense depth cameras were the compact size and power requirements, something that is an important consideration for an autonomous robot that is expected to navigate significant distances before returning to a charging base. The quality of picture and sensing capabilities of the Intel RealSense devices were paramount to Simbe in choosing the right camera solution for Tally. The ability to run multiple cameras from a single bus

Tally moving through an aisle in a grocery store.

Tally alerts store associates to out-of-stock items so they can quickly refill empty shelves.

in parallel along with strong ROS support and supply chain reliability all led to Intel RealSense depth cameras being evaluated as a strong fit in all categories of consideration.

Results

As a solution for retailers, Tally has already been deployed in more than 12 of the top 250 global retailers in the Americas, Europe, the Middle East and Asia. To date, Tally has navigated more than 50,000 miles in-store alongside customers and employees and has analyzed over a billion shelf tags. This frees up 30-100 hours a week of tedious inventory and compliance tasks for store associates. Tally pays for itself within 30 days at a new store, with an average 20% reduction in out of stock items and improved customer satisfaction.

Tally can audit around 10,000 items in 30 minutes, identifying issues such as out-of-stock items, misplaced merchandise, incorrect price tags, outdated promo tags and more. Instead of relying on store associates to perform this monitoring, Tally identifies issues and then shares precise information about them with store teams. This enables faster and more efficient handling of potential problems for retailers, and a more-fulfilling day to day experience for store teams.

Intel RealSense depth cameras are essentially the eyes of Tally. They allow for a level of accuracy and fidelity that empower the robot to do what it was designed to do: find and read tags, compare them to what is physically on the shelf, and empower our retail partners with the critical inventory information they need to streamline operations and offer better customer experiences in store. Without the high-quality depth images that Intel RealSense cameras provide, Tally would be ineffectual in its mission to rid the world of out-of-stock shelves.

Where to Get More Information

Learn more about Tally and Simbe Robotics

https://www.simberobotics.com/platform/tally/

Learn more about the Intel RealSense Depth Cameras

https://www.intelrealsense.com/stereo-depth/

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