Case Study

Food Service Automation

Recipe for Success: Using Machine Vision to Optimize Kitchen Operations

RealSense Enables Real-Time Inventory Management

Spotlight on PreciTaste

New York-based PreciTaste offers several popular products to automate routine kitchen tasks. Machine vision technology helps workers at different food service stations to predict demand and replenish ingredients.

PreciTaste

"RealSense depth cameras allow us to provide a reliable and consistent vision AI solution for customers with makelines and buffets. It's the best offering we've found for our needs."

– Hauke Feddersen, Vice President of Operations, PreciTaste

Challenge: In the fast-paced food service industry, managing inventory can be a constant challenge. Overpreparing often leads to food waste while underpreparing can result in dissatisfied customers and lost revenue.

Solution: PreciTaste, a pioneer in AI-powered software automation, created Station Assistant to streamline kitchen operations and eliminate guesswork. This unique technology platform relies on RealSense™ stereo depth technology to detect, classify, and track food inventory levels.

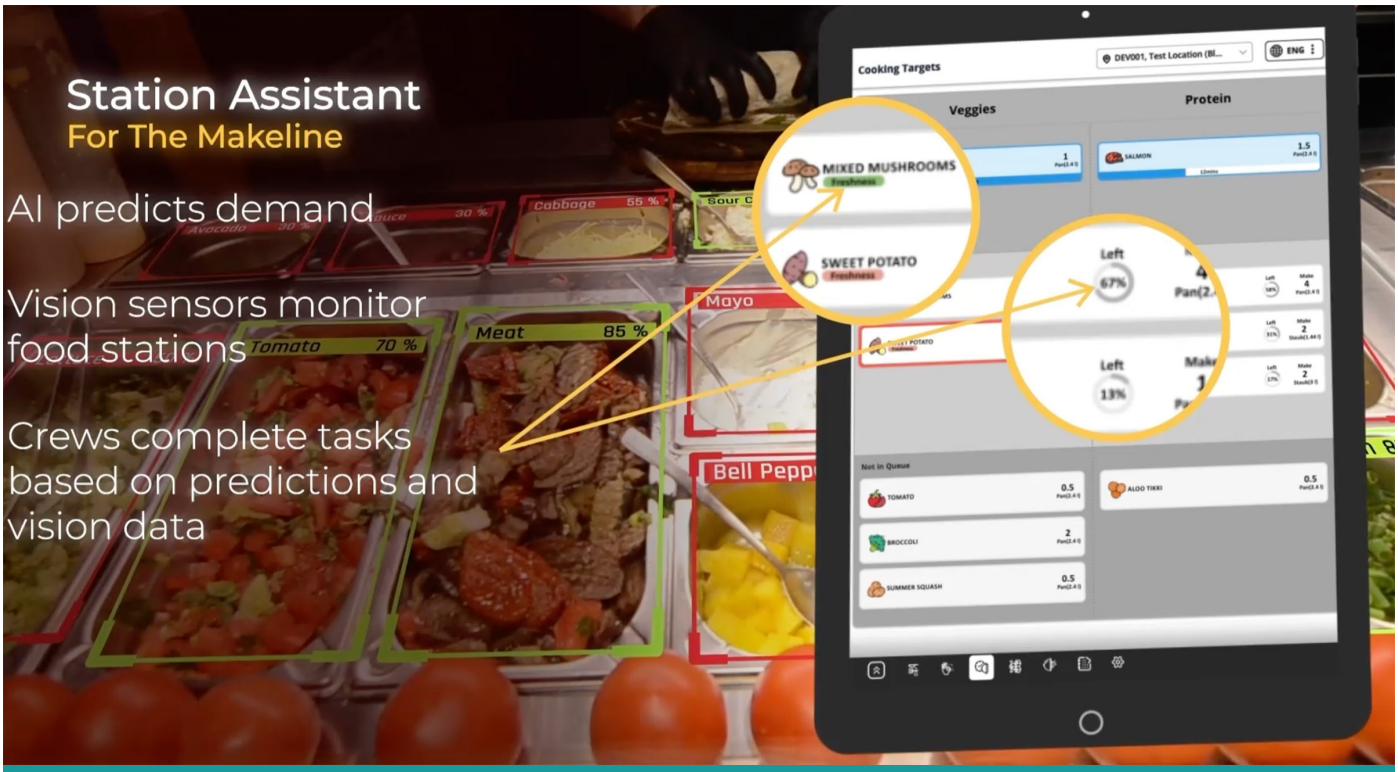
Results: Station Assistant helps restaurants reduce costs, increase operational efficiency, improve labor productivity, and enhance customer satisfaction.

Introduction

According to the United States Department of Agriculture (USDA), food waste in the United States is estimated at between 30 and 40 percent of the food supply. The food service industry is responsible for approximately 12.8 million tons of food waste each year, valued at around $139 billion. Much of this waste arises from inefficient inventory management. Traditional planning methods rely on manual counts and estimates, which can be inaccurate and inefficient.

PreciTaste approaches these issues in a new way, utilizing a powerful combination of predictive, generative, and vision AI to automate essential kitchen tasks. Powered by machine vision technology, its Station Assistant solution leverages RealSense technology to accurately measure food volumes in real-time, optimizing inventory management and reducing food waste.

"Our software automates essential kitchen functions, from ingredient preparation and production planning to cooking and baking," explains Hauke Feddersen, vice president of operations at PreciTaste. "Our out-of-the-box solutions are easy to implement and provide a significant return on investment for our customers."



Simplifying back-of-house operations with AI

RealSense: A Vision for Smarter Kitchens

PreciTaste required a sophisticated depth camera that was easy to integrate into its restaurant automation solutions. It had to combine RGB and depth sensing to accurately identify objects and estimate the volume of food ingredients in prep bins. Furthermore, because Station Assistant cameras are often mounted on the ceiling above food service lines, PreciTaste needed depth cameras with long-range viewing capabilities. They also had to be able to obtain clear images through glass hoods, bins, and display cases. Finally, the cameras had to be affordable so that the solution would be accessible to cost-conscious restaurants.

RealSense Depth Camera D455 checked all the boxes.

"The combination of cost, depth-sensing performance, and the integrated RGB camera made RealSense Depth Camera D455 the perfect choice," Feddersen says. "The price point is good too: utilizing RealSense technology reduced our hardware costs by $500 to $1,000 per restaurant."

Accurate Measurement Reduces Waste

Robust 3D object measurement is the cornerstone of the Station Assistant application. The cameras gather dimensional data that can be used to measure ingredients of any size, shape, texture, and configuration—from chopped tomatoes to guacamole.

According to Al Indig, senior engineer and project manager at PreciTaste, having global shutters for the depth and RGB sensors improves correspondence between the two different data streams, allowing the cameras to reliably match the field of view between the depth sensors and the RGB sensor. "Our Vision AI system locates the target food and identifies specific pixels to measure distance," he explains. "The depth sensor then uses these coordinates to determine the distance to the food and estimate its remaining volume. By integrating RGB and depth information, we can accurately detect and classify food items, track inventory levels in real-time, and guide kitchen staff on necessary refills based on predicted demand."

Watch a short video:
Station Assistant Featuring RealSense

Rapid Development with the RealSense SDK

PreciTaste's engineering team used the RealSense software development kit (SDK) 2.0 to accelerate the development process. According to Indig, the SDK includes out-of-the-box APIs for critical machine vision functions such as object tracking, 3D reconstruction, and spatial analysis. On-chip self-calibration within the SDK enables quick and accurate modeling of food items.

"The RealSense SDK 2.0 allowed us to easily test sensor positioning and settings, which saved valuable development time," Indig adds. "In addition, the integrated RGB and depth sensor design eliminated the need for complex, separate solutions for buffets and makelines."

Collectively, the RealSense SDK has given PreciTaste a versatile set of tools for building custom applications for inventory management, food portion control, and quality assurance.

Machine vision technology optimizes inventory management, reduces food waste, and improves operational efficiency.

The Power of AI in Food Service

PreciTaste's AI-driven solutions have been successfully deployed in various food categories and food service sectors, delivering measurable results such as reducing labor costs by an average of 8%, cutting food costs by at least 5%, and boosting restaurant sales by up to 25%, according to PreciTaste company reports. AI-powered tools enable operators to optimize kitchen tasks, improve forecasting, predict demand, and streamline kitchen operations, allowing over-worked restaurant managers to focus on the guest experience.

Feddersen values the ongoing collaboration with RealSense, which has helped his team build momentum with a growing set of AI-powered solutions tailored to specific food service markets. "RealSense technology has been instrumental in helping us find the right hardware and understand technical specifications," he concludes. "Being associated with Intel adds both visibility and credibility to our food service solutions."

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>
> – Al Indig, Senior Engineer and Project Manager PreciTaste

Technical components of the solution

- RealSense Depth Camera D455
- PreciTaste Station Assistant

Learn More

- **PreciTaste**

https://precitaste.com

- **RealSense Technology**

https://www.realsenseai.com