

How Intel® RealSense™ Depth Sensing Technology is Helping Aethon Create Industry-Changing Mobile Delivery Solutions

Aethon's newest TUG Robots use Intel® RealSense™ technology to help guide autonomous delivery robots in the manufacturing, healthcare, and hospitality industries



At a Glance

Challenge

Healthcare, manufacturing, and hospitality industries face a costly challenge—moving things from place to place efficiently. Many mobile delivery robots require multiple sensors and complicated programming, and this means a higher bill of materials (BOM) cost and challenges accommodating a wide variety of use cases.

Solution

Use Intel RealSense computer vision technology to provide mobile delivery robots with leading-edge, easy-to-integrate object detection and enhanced navigational skills at an affordable price point.

Results

Aethon is redefining the mobile robotics industry with the introduction of Intel® RealSense™ cameras. With Intel RealSense technology integrated into their products, Aethon is able to provide improved navigational capabilities and more affordable products to meet the varied needs of the hospitality, manufacturing, and healthcare industries.

Challenge

Healthcare, manufacturing, and hospitality environments face a costly challenge—moving things from place to place efficiently. In workplaces in which staff are already overstretched, the need for constant delivery represents a real logistical headache.

In hospitals, thousands of linens, medicines, and meals need to be transported each day. Busy nurses can't be burdened with having to constantly deliver items. Such challenges increase when infectious disease outbreaks create surges in demand, and extra measures are needed to minimize human contact wherever possible. Manufacturers also need a delivery solution that moves a steady flow of materials to the production line so that they can execute round the clock. Similarly, hospitality management must address issues of guest deliveries, security, housekeeping supplies, and banquet operations at all hours of the day.

Aethon's robots have been in the market since 2004. When their engineers first began to develop robotics solutions to meet these challenges, the sensing technology of the time presented obstacles of its own. Creating a robot that could navigate busy hallways while avoiding and moving around objects required combining an assortment of sensors and creating algorithms to interpret the

“(Intel) RealSense has allowed us to improve the navigational capabilities of our products faster and at a lower cost, while enhancing sensor coverage.”

Spencer Allen, CTO
Aethon, Inc.



data from those sensors. This made price points rise and scalability difficult. Aethon saw the opportunity to improve the capability, cost and reliability of their robots using the rapidly evolving camera technology from Intel.



Solution

Intel RealSense cameras proved to be an ideal solution that allowed the Aethon TUG series of robots to meet workplace challenges.

The Intel RealSense D400 series of cameras allows TUG robots to see obstacles in a way that older ultrasonic or infrared sensors cannot, by calculating depth and location with pinpoint accuracy. High image resolution makes it possible for TUG robots to recognize variations in object shape and to make decisions on obstacle avoidance while in motion and respond correctly even if the object only has a small visual signature.

“We knew that camera vision technology was going to win the day [in mobile robotics]. With Intel® RealSense™ technology, we can now achieve navigation fidelity not possible with lasers, sonar, or infrared.”

*— Tony Melanson, VP of Strategy and Marketing
Aethon, Inc.*

In models such as the T4 that are specifically designed to move large and complex items such as carts, Intel RealSense depth camera technology allows the robot to recognize features of the cart—such as the legs—and measure cart clearance so that the robot can make decisions on what to avoid and where to place itself for maximum efficiency of movement. In a manufacturing or hospitality environment that utilizes high volumes of carts, this ability to recognize features and navigate accordingly is an essential feature that saves countless hours.

The small size of Intel RealSense cameras also helps Aethon save vital space and increase payload capacity. CTO Spencer Allen sees the Intel RealSense product line as a culmination of years of sensing technology. As he says—“(Intel) RealSense has allowed us to create smaller form factor products at a lower cost, and still have the sensor coverage that we need.”

Intel's reputation also helps Aethon with product longevity, particularly with large accounts. Customers want to know that

Aethon Keeps Things Moving in a Wide Range of Industries

Healthcare

In hospitals that use TUG robots driven by Intel RealSense technology, nurses report a higher job satisfaction and more time for patient care. In times of increased demand, TUG robots act as a force multiplier, navigating busy hallways to make deliveries of meds, meals, and supplies. TUG safely provides scheduled and on-demand delivery of linens to nursing units. In the lab, automated robotic delivery eliminates the headaches and restrictions associated with pneumatic tube systems. TUG also provides a safer, more efficient way to manage waste removal. TUG units—featuring Intel RealSense cameras with high resolution imaging and programmed to integrate with the Intel RealSense SDK—have the capability to navigate a complex and ever-changing environment.

Manufacturing

In manufacturing environments, the high resolution T4 robot eliminates cart tending and delivery. This industrial mobile robot automatically picks up and drops off carts and delivers them anywhere they are needed: a line-side location, inventory, inspection or finished goods. Intel RealSense technology makes this possible, providing the high resolution imagery and depth sensing technology that is essential to deliver complex objects such as carts. The system can be programmed to automate the dumping of equipment so the cart can empty without employee assistance, which is especially useful after hours.

Hospitality

The precision navigational skills that Intel RealSense technology brings to Aethon's TUG robot series also make a range of applications possible in the hospitality sector.

TUG mobile robots use navigational and depth-sensing technologies from Intel RealSense to move the things needed to make guest experiences more memorable and conference center events successful—from room service, to food and banquet supplies to linens and table settings. And when the event is over, TUG can even take out the trash.

Hotel managers can benefit from an autonomous mobile robot that picks up carts loaded with materials, transports them, and drops them off automatically, all while staff is busy doing the most important parts of their job. The Aethon T4 shuttles carts through the hotel on demand. Fresh stock is delivered as needed, and this allows the staff to work inside the room more securely. The T4 automatically picks up used supplies such as linens and trash to eliminate the time spent returning to central laundry areas.



Results

By integrating Intel RealSense cameras into their TUG robots, Aethon is meeting industry challenges and redefining the mobile robotics field. Intel RealSense technology makes it possible for Aethon to deliver lightweight, low power, affordable and easy-to-use robots that recognize and avoid obstacles better than ever before.

Aethon TUG Robots using Intel RealSense cameras can be found in hospitals, hotels, conference centers, and manufacturing plants in countries around the world. The inclusion of Intel RealSense technologies and the legacy the Intel name brings help Aethon sell-in their products to new potential clients in an expanding market. Using Intel RealSense cameras—with single computer vision sensors—has allowed Aethon to meet this increasing demand. Their product line has expanded, the time to market has shortened, and with their new products they are able to help companies save hours and streamline operations across many sectors.

The Intel RealSense Brand Advantage

With the addition of Intel RealSense technology, TUG robots achieve precise object recognition and navigation fidelity that was not possible with lasers, sonar, or infrared sensors at a price point that is affordable and that comes in a compact, appealing form factor.

Intel RealSense and Aethon's partnership shows what happens when Intel's computer vision technology is put to use by true innovators in the field of mobile robotics.

The result? A hospital sees an enormous savings in time and resources with scheduled and automated deliveries of key medicines and supplies. A manufacturing plant streamlines its operations and is able to perform ongoing deliveries round the clock. A hotel conference center is able to deliver to their guests safely and securely, saving staff hours.

For More Information

More information about Intel RealSense technology can be found [here](#).

More information about Aethon and its products can be found [here](#).

the product they purchase—and its components—will be supported over the life of the product, be reliable and require minimal maintenance.

“Small companies get snatched up,” Aethon VP of Marketing Tony Melanson explains, “and we need a powerhouse that we can work with for a long time.”

Aethon also puts the Intel RealSense Software Development Kit (SDK) to use, streamlining the integration of different Intel RealSense cameras in a single robot. The easy-to-integrate software makes it simple and straightforward for product developers and designers to integrate Intel RealSense cameras into their products seamlessly and efficiently and helps reduce time to market for new robot designs.

Intel RealSense Cameras + Aethon TUG Robots —

- Improved navigational capabilities
- Small form factor
- Faster time to market
- Competitive price point
- Industry leading depth sensing technology
- Location mapping
- Intel's reputation for reliability and support



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