

Bipedal robot Digit seen as final step in autonomous delivery system

28 May 2019, by Nancy Cohen



Credit: Ford Motor Company

Self-driving cars for delivering packages is already familiar enough as a "vision." As Ford continues sketching out the self-driving car as part of the transportation future, the delivery system that needs to fulfill the customer's one-click shopping wish adds to its interest.

What good is a [self-driving](#) delivery van if the packages are not easily reaching the customer as the final step?

Ford has turned its attention to a delivery robot.

Agility Robotics' new robot, Digit, has got into the act. Along with Ford and its [self-driving cars](#), they have worked on Digit as the robot that can help get packages to your door efficiently. Actually, consider that the missing final step in working out a happy home delivery future. Package fulfillment, check. Self-driving car, check. Next? Damion Shelton, CEO of Agility, pointed out that "real-world logistics systems are composed of many specialized pieces."

"Together, we will work toward making sure self-

driving vehicles are uniquely outfitted to accomplish something that's proven surprisingly difficult to do," said Ken Washington, Vice President, Ford Research and Advanced Engineering, and Chief Technology Officer: "Carry out that final step of getting your delivery from the car to your door."

Wait, why would it be so difficult for cute little robots with wheels to deliver the package at the customer's door? The answer evidently is in the engineering requirements to come up with a bot that can navigate the nuances of environments.

"Gaining access to a customer's door often requires walking through obstacles, including going up stairs and dealing with other challenges, which can be hard for robots with wheels to do," said Washington.

The robot's design allows for Digit to fold itself up in the back of a self-driving vehicle. When called to action, it gets out of the car and becomes a two-legged carrier.

Ford Motor Company posted a video earlier this month.

This two-legged mechanical hero delivering a package of goods for a time-burdened exam candidate gets out of the car and easily manages climbing the few short steps up to the door.



Credit: Ford Motor Company

"When a destination is reached, the back door is opened, Digit unfolds itself, grabs a package and ambles up to the front [door](#) to drop it off," said *New Atlas*.

Digit lifts packages that weigh up to 40 pounds. As for things that go bump day or night, its arms help it out. "For us," said Dr. Jonathan Hurst, CTO and co-founder of Agility, "arms are simultaneously a tool for moving through the world - think getting up after a fall, waving your arms for balance, or pushing open a door - while also being useful for manipulating or carrying objects."

The Agility site said Digit is [durable](#) enough to catch itself during a fall using its arms to decelerate.

Digit has LIDAR and a few stereo cameras; Digit's torso houses two multi-core CPUs.

Washington also mentioned what makes the two-legged robot succeed if having to climb outside steps to reach the door, or other challenges: A data interchange between the self-driving car and the robot steers the biped. In brief, the Ford concept is for autonomous vehicles and their delivery robots to share [sensor data](#).

"When a self-driving vehicle brings Digit to its final destination, the vehicle can wirelessly deliver all the information it needs, including the best pathway to the front door. Through this data exchange, Digit can work collaboratively with a vehicle to situate itself and begin making its delivery."

Not only that, but there would be an important interchange if Digit were to meet an unexpected obstacle; "it can send an image back to the vehicle and have the vehicle configure a solution. The car could even send that information into the cloud and request help from other systems to enable Digit to navigate, providing multiple levels of assistance that help keep the robot light and nimble."

Unexpected obstacles? Stephanie Mlot, *Geek.com*, offered some examples. "But what if a strong wind has blown the trash cans into its path? Or a garden ornament is slightly [askew](#)?"

So, what's the verdict? Charlotte Jee's "The Download" in *MIT Technology Review* called the combination of driverless car and robot compelling, "especially because the two could share camera and lidar sensor data to help each understand their surroundings. The [robot](#) could also [charge](#) in the car, helping to reduce the need for lots of bulky batteries."

[Agility Robotics](#) was founded in late 2015 as a spinoff of Oregon State University. The team's areas of expertise range from mechanical and electrical engineering to software. They unveiled their bipedal Digit in January. Its four degree-of-freedom arms support Digit's utility, especially relevant for delivery tasks.

More information:

[medium.com/self-driven/meet-di ...
olution-418d9995bb97](https://medium.com/self-driven/meet-digit-robot-418d9995bb97)

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