

## Meet FoodBot, a four-wheeler robot that delivers food from its 'belly' to yours



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FoodBot is a four-wheeled electronically powered robot that delivers lunch and dinner orders at Nanyang Technological University.

- A self-driving outdoor delivery robot has delivered more than 6,000 meals since June last year
- It runs its rounds at the Nanyang Technological University and the nearby CleanTech Park
- It is developed by student start-up Whizz Mobility, comprising undergraduates from two universities here

SINGAPORE — It is hard to spot a smile these days from service providers, not least because everyone is wearing a mask as protection against the coronavirus. So a painted-on smile on a robot will do just fine to lift the spirits — if not better.

At Nanyang Technological University (NTU), undergraduates and staff members have been getting their food delivered to them by a robot — which looks like a box on four wheels.

Emblazoned with two big eyes and a cheeky smile on one side and the words “Your food is here!” on another, the electronically powered self-driving robot rolls up to customers who have ordered food and are waiting at collection points.

Then, the lid of its boxy body springs open automatically as it utters a soft command, “Please pick up the food”.

This is FoodBot, Singapore’s first outdoor delivery robot.

So far, a handful of them have delivered more than 6,000 meals and carried about S\$60,000 worth of goods, which includes both food and groceries.

FoodBot was first launched last June to deliver food across the NTU campus by start-up Whizz Mobility, which is made up of seven students from NTU and one from the Singapore University of Technology and Design.

Customers order food through the mobile application Cates, choose their collection points and wait there. They will be notified as well when FoodBot is almost reaching them.

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FoodBot has delivered more than 6,000 meals since its launch in June 2020. Photo: Ili Nadhirah Mansor/TODAY

In December, FoodBot started making deliveries to eco-business CleanTech Park, which is adjacent to NTU.

There are now five FoodBots, which are deployed during lunch and dinner depending on demand.

They travel along pre-mapped routes at 5km/h and primarily stick to pavements, but they can also travel across grass and mud.

They use artificial intelligence to identify obstacles such as humans or poles. For example, if a person is blocking the path, the robot will stop.

For safety reasons, they are remotely monitored by a human supervisor, who intervenes when necessary, such as if the robot is stuck on a slope or the layout of the route has changed.

Mr Melvin Foo, 23, founder and chief executive officer of Whizz Mobility, described the FoodBot as an “engineering dream”.

The undergraduate from NTU’s Renaissance Engineering Programme, an interdisciplinary engineering programme, said: “Almost every part of the robot is made by us, from 3D-printed parts to self-designed custom-printed circuit boards.”

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The young men who produced the robots. From left: Whizz Mobility founder Melvin Foo, 23, lead electrical engineer Victor Gwee, 23, software engineer Lakshyajeet Dwivedee, 21, lead mechanical engineer Herh Peng Leng, 23, and operations manager Zechary Hoe, 23. Photo: Ili Nadhirah Mansor/TODAY

In 2019, Whizz Mobility was working on a self-driving electric scooter-sharing platform, but their plans were upended after e-scooters were banned from footpaths in November that year.

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Within two months, the team pivoted to food delivery and adapted the technology to a new product, which became FoodBot.

Mr Victor Gwee, 23, lead electrical engineer at Whizz Mobility and a student from the Renaissance Engineering Programme as well, said that using robots instead of humans is one way to increase workforce productivity, especially with Singapore's ageing population and manpower crunch.

Mr Foo agreed, saying that with robots making deliveries, Singaporeans can move to doing higher-level tasks such as supervising.

Mr Gwee said: "Instead of having one delivery rider make one delivery at a time, a robot supervisor could supervise multiple robots and make multiple deliveries at once."

The start-up partnered with Cates, which has about 60 vendors on its delivery app.

NTU final-year student Tay Hui Zhi, 22, stays on campus and has been collecting her food orders via FoodBot since August, using it about three to four times a week.

It is more affordable than other channels on the market because there is no delivery fee, she said.

"I use it very frequently, especially during my finals when I'm just cooped up in my room. It's very convenient," she added. "There isn't much difference between receiving food from a robot or a person, frankly. It's just knowing that it is more efficient and can serve so many people."

Mr M Ananda, 47, owner of Ananda Kitchen, one of the vendors on Cates that uses FoodBot, said that for the past three months, he has been preparing and loading meals into the robot twice a day, during lunch and dinner.



Mr M Ananda, owner of Ananda Kitchen, placing food that needs to be delivered into FoodBot. Photo: Ili Nadhirah Mansor/TODAY

Although his restaurant is also on the GrabFood app, he receives more orders via Cates — about 40 a day, compared to 15 to 20 for GrabFood.

His customer base has expanded after the introduction of FoodBot, he said, because NTU students who stay on other parts of campus can order from his store without travelling down to NTU's Binjai Hall, where his shop is located.

"It's good for our business," he said. "We don't have enough manpower to deliver the food."

The start-up is in talks with one or two food-and-beverage partners on potential collaborations, but details are not yet finalised, Mr Foo said.

Mr Gwee said that in the next few months, Whizz Mobility hopes to open more delivery routes around NTU and cover other areas such as business parks and other universities.