

Crop Transportation Robot

Tech ID: 33312 / UC Case 2021-915-0

ABSTRACT

Researchers at the University of California, Davis have developed an autonomous crop transportation robot to aid field workers during harvest.

FULL DESCRIPTION

For many fresh-harvest crops, such as strawberries, grapes, cherry tomatoes, and berries, manual harvesting is the norm as it allows workers to selectively pick crops at their peak ripeness. Most commonly workers place crops in a cart or wheelbarrow and walk them back to a collection station at another location on the farm. Extensive transportation results in wasted time as workers spend more time walking back and forth between locations rather than picking crops. Consequently, robotic vehicles have been considered as a solution to improve crop harvesting efficiency. However, existing systems aren't fully autonomous and often require significant training time to learn new terrain and scheduling patterns to effectively deliver crops.

Researchers at the University of California Davis have developed a fully autonomous crop transportation robot to improve harvesting productivity without additional programming or training. As soon as the weight of a collection basket indicates that it is about to be full, these robots travel to the picker, deposit an empty crop container, and transport the full one to the drop-off location. Data collected by each machine, such as location and crop weight, is sent to a field computer to generate real-time analytics. From there, predictive scheduling directs where robots are sent to minimize waiting times. Predictive algorithms offer a major advantage over existing systems and allow one robot to service multiple workers simultaneously. These crop-delivery robots save time, reduce the physical toll on workers because they don't need to carry the crops to the collection station, and as a result improve overall harvesting productivity.

APPLICATIONS

- ▶ Robotic vehicles to aid workers during crop harvests

FEATURES/BENEFITS

- ▶ Predictive scheduling to minimize worker waiting times
- ▶ One robot can transport crops for multiple workers simultaneously
- ▶ Doesn't require additional training time or programming

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,197,232	01/14/2025	2021-915
United States Of America	Published Application	20250176468	06/05/2025	2021-915

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OTHER INFORMATION

KEYWORDS

labor, harvest,
 collaborative robots,
 transport, scheduling,
 robotics

CATEGORIZED AS

- ▶ **Agriculture & Animal Science**
 - ▶ Processing and Packaging
- ▶ **Computer**
 - ▶ Hardware
 - ▶ Other
 - ▶ Software
- ▶ **Transportation**
 - ▶ Other
- ▶ **Engineering**

▶ Robotics and
Automation

RELATED CASES

2021-915-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Programmable System that Mixes Large Numbers of Small Volume, High-Viscosity, Fluid Samples Simultaneously
- ▶ Software Of Predictive Scheduling For Crop-Transport Robots Acting As Harvest-Aids During Manual Harvesting

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