

Bees' 'waggle dance' may revolutionize how robots talk to each other in disaster zones

Recent research led by Dr Abhra Roy Chowdhury on 'Package Delivery Robots' for Industry 4.0 published in 'Frontiers Science Communications (Robotics and AI)' is the "Most Viewed Article of July 2022".

Robotic communication in a multi-robot system relies heavily on network connections through communication protocols and if a system of robots needs to be deployed in areas of lack of network resources, robots will have to rely on other sensors for interaction. This research aims to implement gestural interaction in a networked system of robots, instead of the usual network-based communication, to not only navigate but also deliver packages, with the aid of a human.

Dr Chowdhury has been involved in developing nature-inspired technologies for over a decade and has successfully developed technologies like fish-inspired robotic underwater vehicles and turtle-inspired water pipeline inspectors. This idea of using gestural interaction is inspired by the 'waggle dance' that bees use to communicate with one another.

In this research, two robots were used to demonstrate a vision-based gestural interaction framework to carry out the task of package handling in cooperation with a human. The robots use an object detection algorithm and depth perception to detect and react to the gestures. This approach enables each robot to be independent of a centralized controller or server.

This technology may revolutionize how robots talk to each other where communication networks are unreliable and such interactive robots can be deployed for search and rescue operations in disaster zones and environments that humans can't foray into, for commercial applications such as package delivery, and in industrial settings where multiple robots talk to one another when communication networks are unreliable.

Citation: Joshi K, Chowdhury AR, Bio-inspired Vision and Gesture-based Robot-Robot Interaction for Human-Cooperative Package Delivery, Frontiers in Robotics and AI: 179 (2022).

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IISc Press: https://iisc.ac.in/robots-take-cues-from-dancing-bees-and-human-gestures-to-deliver-packages/?fbclid=IwAR1w5sYvvn_PIPtbrNCABlkLkSY5EYWIrnLvbFomPIMaTKDKWKgQUg6GbE

Altmetric link: https://frontiers.altmetric.com/details/130775917/news?fbclid=IwAR3d-KZ9HyDGIQ4T78lf_DjJW7mXODumdVqz-4AzC3Qb-LIOqm85Hjru6l

Lab Website: <https://cpdm.iisc.ac.in/ril/>