

Unsettled Topics in Obstacle Detection for Autonomous Agricultural Vehicles

Stewart Moorehead, PhD

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About the Editor



Stewart Moorehead worked at Deere and Company for 16 years, developing and fielding autonomous tractors, lawn mowers, and utility vehicles. As the Manager of Field Robotics, Stewart led robotics research at the Technology Innovation Center, focusing on obstacle detection and improving the robustness of robotics technology to function in unforgiving conditions found on farms and construction sites.

Stewart served on the Board of Directors of the Association of Unmanned Vehicle Systems International (AUVSI) from 2013 to 2016 and is a member of the AUVSI Agricultural Subcommittee as well as the IEEE Robotics and Automation Society's Agricultural Robotics and Automation Technical Committee. Stewart has a PhD in Robotics from Carnegie Mellon University and bachelor's and master's degrees in Electrical Engineering from the University of Waterloo.

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Abstract

This report deals with the unsettled topic of detecting obstacles for autonomous agricultural vehicles and examines some of the challenges of environmental object detection and collision prevention. Work on the following topics is ongoing and of particular importance to agricultural applications:

- Air obscurants
- Holes and soft spots
- Prior maps
- Vehicle geometry
- Standards
- Close contact with large objects

Obstacle detection is one of the major missing pieces that can remove humans from highly automated agricultural machines today and enable the autonomous vehicles of the future.

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