2026 Innovation Award Nominee

PTx Trimble - OutRun Autonomous Tractor Platform

The OutRun Autonomous Tractor Platform represents a transformative advancement in agricultural engineering, redefining how modern farming operations are performed. Developed by PTx Trimble and led by Darcy Cook, P.Eng., and Jorge Viramontes, P.Eng., alongside a multidisciplinary Manitoba-based team of approximately 70 professionals, OutRun introduces commercially available autonomy for large-scale farming tasks through an innovative retrofit approach.

OutRun enables existing tractors to be outfitted with advanced autonomous capabilities, allowing them to perform complex operations such as grain cart handling during harvest and tillage operations without a driver in the cab. By focusing on retrofit integration, the platform eliminates the need for costly new equipment, significantly lowering barriers to adoption while maximizing the value of farmers' current assets. This practical and scalable approach represents a novel application of advanced engineering technologies within a traditionally conservative industry.

The system integrates a sophisticated array of technologies, including lidar, radar, and camera-based perception systems, combined with machine learning algorithms to detect and classify obstacles in challenging agricultural environments. These are complemented by precise localization and navigation systems, real-time safety architectures, and fully integrated machine controls governing steering, propulsion, and braking. High-performance, ruggedized computing platforms enable the coordination of these systems, ensuring reliable operation in dynamic, dusty, and unstructured field conditions.

Beyond individual subsystems, OutRun demonstrates exceptional engineering complexity through its ability to orchestrate complete farming workflows. Its mission management and user interface systems allow operators to coordinate multiple machines and tasks seamlessly, enhancing efficiency and productivity during critical operational windows. Delivering this capability in real-world agricultural settings marks a significant advancement in applied autonomy.

The impact of OutRun is both immediate and far-reaching. Global trends toward urbanization have created a critical shortage of skilled agricultural labour, placing increasing strain on farm operations and food production systems. OutRun directly addresses this challenge by enabling farms to operate effectively during labour-intensive periods, particularly at harvest. Its retrofit model also promotes sustainability by extending the life and utility of existing equipment while optimizing operational performance.

With its core development team based in Winnipeg and built on over a decade of innovation, OutRun establishes Manitoba as a leader in autonomous agriculture technologies. Its long-term significance is expected to rival the historic transition from animal-powered farming to mechanized tractors, ushering in a new era of intelligent, autonomous agricultural systems.