ALBERTA INNOVATES

# CLEAN RESOURCES

AGRI-FOOD INNOVATION

DATA AND DIGITAL SOLUTIONS

## AI Data Recording Kit Which Enables Autonomous Farm Machinery

Mojow is developing an AI (Artificial Intelligence) Data Recording Kit (EYEBOX™). EYEBOX™ is a small, rugged and economical sensor suite that contains multiple cameras, as well as GPS, combined with a powerful computing unit for real time processing of collected data. When farm machinery is in operation, the EYEBOX™ automatically collects images captured by the cameras and passes them through a deep neural network that classifies each pixel to create (or update) a complete digital twin representation of the entire farming entity (field boundaries, roads, or anything else of interest). The digital twin serves as the real-time digital counterpart of a physical object or attribute within the farm. The completed digital twin becomes the foundation of Mojow's autonomous navigation controller.

### FUNDING DETAILS

**RECIPIENT:**
Mojow Autonomous Solutions Inc.
PI: Owen Kinch

**PARTNERS:**
Lakeland College
University of Alberta

**TOTAL BUDGET:**
$2,249,520

**AI FUNDING:**
$500,000

**PROJECT DATES:**
Jan 2022 – DEC 2023

**PROJECT TRL:**
Start: 5
End: 7

## APPLICATION

The EYEBOX™ will be installed on farming equipment to enable automated data collection and operation. Geo-referenced information of interest to farmers (e.g., location and size of rocks, downed trees, ruts and wet areas within a field) will be displayed through a mobile application. The EYEBOX™ will allow for the conversion of conventional tractors to autonomous tractors or can be integrated in ready-to-market OEM farm machinery to enhance functionality.

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## PROJECT GOALS

- Develop a market-ready AI data recording device that can transform a complete physical farming operation into a digital twin.
- Streamline on-farm operations through automated data collection, innovative digital technologies, artificial intelligence and robotics.
- Develop an “autonomous farm implement transitioning system” that can transition any farm implement safely from the field working position to the road transport position and vice versa.
- Pursue a greater level of automation and precision in agriculture to increase cost efficiency, sustainability and productivity.

## BENEFITS TO ALBERTA

- Increase farm productivity and sustainability by consistently achieving critical timing windows, increasing the amount of actionable data and reducing risk associated with growing labour shortages.
- Increase the safety of farmers by automating routine or unsafe tasks.
- Job creation for Albertans.

**2 New Products/Services**

**4 Students Trained**

**2 Patents**

**10 Project Jobs**

## CURRENT STATUS

### MAY 2022

Mojow has collected more than 100 TB of specific data (field boundaries, implement transitions, etc.) and tested early deep learning detection models onboard operating farm equipment. Work in 2022 is focusing on implementation of the Autonomous Navigation and Control (EYEBOX™) and demonstration of a heavy harrow implement autonomously transitioning between "field" and "transport" position.