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Precision Agriculture Drone Algorithms (20140013, Dr. Volkan Isler)

Technology No. 20140013

IP Status: Issued US Patent; **Application #:** 14/498,369

Unmanned Aerial and Ground Vehicles in Precision Agriculture

Unmanned Ground Vehicles and Unmanned Aerial Vehicles (UGV/UAV) can be used in precision agriculture to optimize farming efficiency. They are capable of cooperatively predicting nitrogen deficiencies in crop soil. The agriculture drone units are guided by algorithms designed at the University of Minnesota not only to pinpoint field locations that need nitrogen measurements, but to get the robots to these spots along the most low-cost pathways. Utilization of this technology will allow farmers to better manage farm inputs to enhance crop productivity and environmental health, and overcome obstacles previously insurmountable by remote sensing or manual data collection techniques.

MN-IP Try and Buy

Try

- Trial period up to 18 months. $5000/6 months.
- Fee waived if MN operating company or if sponsoring $50,000+ in research.

Buy

- Exclusive license for a $10,000 conversion payment.
- U.S. patent expenses due upon issuance.
- 5% Royalty (4% for MN companies) after $1 million in product sales.

Remote Sensing of Agriculture Data

Precision agriculture can improve crop productivity and farm profitability through better management of farm inputs. One of the key components of precision agriculture is data collection. At present, there are two primary approaches to data collection for precision agriculture: remote sensing and manual data collection. These two methods for estimating soil composition and crop health are drastically limited by weather, cost and time. Satellite and aerial remote sensing are severely limited by cloud cover, and remote sensing from a manned aerial device (either flown by a pilot or radio-controlled by a professional operator) is costly. Furthermore, the manual data collection process can be tedious and time-consuming

BENEFITS AND FEATURES OF PRECISION AGRICULTURE DRONE ALGORITHMS:

- Low-cost and on-demand sensing capabilities with minimal human involvement
- Not dependent on weather disrupted solutions (GIS & satellite)
- Increases sampling performance by 30-35%

Phase of Development UAV prototyped and tested. UGV is in progress.

Researchers

Volkan Isler, PhD
Associate Professor, Computer Science Department, College of Science and Engineering
External Link (www-users.cs.umn.edu)