Agricultural Robot Estimates Perishable Fruit Yields

Technology #20150091

**UAV with Computer Vision Algorithm**

An unmanned aerial vehicle (UAV) system collects high resolution spatio-temporal data to automatically estimate perishable fruit yield parameters (e.g. count, size of fruit, number per tree). The small UAV, built with low-cost, commercial off-the-shelf hardware and software components, carries a computer that collects images from onboard stereo cameras. The robot can obtain good views of the fruit in natural settings (i.e., an orchard row), and computer vision algorithms use the stereo images to detect, segment and estimate the size and count of fruit. The algorithm works with no constraints on illumination, specularity or occlusions, and can also detect tree trunks to offer fruit-per-tree counts.

**Precision Agriculture for Orchards**

Due to very thin margins, large farms are looking to automation and precision agriculture to increase their yields while decreasing their expenses. Current implementations use ground robots that require controlled lighting conditions and suffer from less accurate color matching algorithms for estimation. This technology leverages off-the-shelf UAV drone technology with a unique algorithm that uses computer vision to detect, segment and estimate the size and count of fruit.

**BENEFITS AND FEATURES:**

- Detects, segments and estimates fruit size and count
- UAV system
- Automatically estimates perishable fruit yield parameters
- Uses low-cost, commercial off-the-shelf hardware and software components

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• Works in natural settings: no constraints on illumination, specularity or occlusions
• Detects tree trunks

APPLICATIONS:

• Precision agriculture
• Automated agriculture
• Detection of abnormal tree trunks
• Yield monitoring
• Guidance systems
• Fruit orchards

Phase of Development - Pilot scale demonstration

Interested in Licensing?
The University relies on industry partners to scale up technologies to large enough production capacity for commercial purposes. The license is available for this technology and would be for the sale, manufacture or use of products claimed by the issued patents. Please contact Kevin Nickels to share your business needs and technical interest in this precision agriculture technology and if you are interested in licensing the technology for further research and development.

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