

Automated solutions for open-field plot grid creation (Hi-Res UAV imagery)

Background

In the realm of agricultural research, particularly in field trials for vegetables, the creation of open-field plot grids stands as a pivotal component within the Unmanned Aerial Vehicle (UAV) image processing workflow. This process holds paramount importance as it lays the foundation for subsequent analyses and evaluations.

Traditionally, the creation of open-field plot grids for UAV image processing in vegetable trials has heavily relied on manual GPS measurements. However, this method is beset with challenges, notably being time-consuming, labor-intensive, and susceptible to errors. These difficulties are particularly pronounced in scenarios where high-precision transplanteders are not readily available.

The reliance on manual GPS measurements not only imposes burdensome constraints on resources but also introduces inaccuracies that can compromise the integrity of the entire image processing workflow. Without precise plot GPS measurements, the UAV image data cannot undergo proper processing, leading to an inability to generate UAV traits accurately and assign them to individual plots.

Thus, there exists a pressing need for a more efficient, accurate, and reliable solution to facilitate the creation of open-field plot grids in vegetable trials. By addressing these challenges, researchers can enhance the efficacy of UAV-based image processing methodologies, ultimately advancing the progress and insights gained from agricultural field trials.

What we're looking for

We are looking for an innovative and efficient automated workflow or technology that can rapidly generate a geospatially accurate grid for the entire field with minimal manual labor. The proposed solution should eliminate the need for manual GPS measurements and ensure the creation of a precise and complete as-planted grid, integrating seamlessly with the existing UAV image processing workflow.

Our must-have requirements are:

- Automated Plot Grid Creation: Implement a system or workflow that automates the creation of open-field plot grids with minimal manual work

- Integration with UAV Image Processing Workflow: Ensure seamless integration with the UAV imaging processing workflow to accurately assign UAV traits to individual plots.
- Accuracy and Precision: Prioritize accuracy and precision in plot GPS measurements to guarantee the integrity of UAV image data processing.

Acceptable technology readiness levels (TRL): Levels 1-9

1. Basic principles observed
2. Concept development
3. Experimental proof of concept
4. Validated in lab conditions
5. Validated in relevant environment
6. Demonstrated in relevant environment
7. Regulatory approval
8. Product in production
9. Product in market

What we can offer you

Eligible partnership models:

- Sponsored research
- Co-development
- Supply/purchase
- Licensing

Benefits:

Sponsored Research

Sponsored research: Up to \$100,000 for a proof-of-concept, with additional potential funding for further development. Postdoctoral funding over 1 to 2 years within salary ranges consistent with the current market for further evaluation of potential leads, along with possible license of researcher's patented materials.

Expertise

Selected partners will be assigned a company mentor to champion the project, identify gaps in expertise, and meet bi-monthly to ensure project success and timely "Go/No-Go" decision points. Partners will have access to Veg R&D scientists and data analysis experts to provide feedback and guidance as needed.

Tools and Technologies

Tools and Technology: UAV equipment, piloting, and post-plot grid analysis can be conducted with Bayer Crop Science (BCS)-Vegetables R&D team.

Data

Partners can access multiple datasets of manual GPS measurements for comparative analysis.

Facilities and Services

Partners will work collaboratively with BCS-Veg R&D to evaluate technologies within BCS-owned and operated field plots.

Who we are

Bayer's vision of #HealthForAll, #HungerForNone drives our need to strengthen innovation capabilities in all areas of agriculture. We know we can't accomplish this alone, so we're always interested to hear about novel, early-stage scientific innovations that can contribute to feeding the world without starving the planet. You have our commitment to take a look, match with our R&D priorities and provide you timely feedback.

Reviewers

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