Guided Systems Technologies Seeds the Future for UAS on Farms With Help From the Georgia Centers of Innovation

OVERVIEW

Guided Systems Technologies (GST) develops turnkey, fully autonomous Unmanned Aerial Vehicles (UAV) and Unmanned Aerial Systems (UAS) using its patented adaptive neural network technologies. GST has proven its unique adaptive control methods on UAS since 1993 – primarily for military applications.

It is well established that remote sensing can be used to benefit agriculture and crop management. Imagery collected can be processed to obtain surface analysis for a wide variety of applications. Satellites currently provide useful imagery for farmers, but it is very limited. UAS can provide imagery on demand, weekly or even daily, at a much higher resolution. The question is how to provide that imagery at a cost point acceptable to farmers.

GST's goal was to demonstrate the practical use of UAS to gather the imagery and provide it to the farmer in an easy to interpret manner. The imagery would allow Georgia farmers to increase crop yields through early detection, treatment, and resolution of problems that impact productivity and cost.

CHALLENGE

Despite the availability of UAS technology, its practical application in the commercial sector has been greatly hindered by a lack of regulations to govern the safe use of UAS within the national airspace. It is currently necessary to obtain a Certificate of Authorization from the FAA to operate any type of UAS, which can only be presented to public entities, such as a university or government organization.

Alongside federal regulations – or the lack thereof – no former studies from which to gather data exist to help guide GST in its agricultural quest. In order to supply for this new market, GST needed to begin a research project to understand: how many acres could be imaged usefully per day with a single UAS, and the costs associated with obtaining and providing the imagery. GST then needed to learn

Significant connections for the project include:

- Alliance with Middle Georgia State College (MGSC) who acquired the COA from the FAA allowing the UAS to fly in the National Airspace.
- Partnerships with MGSC researchers for the safe and effective UAS operations during the research project.
- Agronomists from the University of Georgia and research crops planted to study the crop management plan, crop inspection and farmer-relevant analysis.
- Sunbelt Ag Expo provided the access to fields for the testing of peanut and cotton crops provided by the Georgia Peanut and Cotton Commissions.

Economic Impact for Georgia:

- An anticipated @22 billion and 2,880 jobs over the first decade of civil UAS integration
- Combination of strong agribusiness and aerospace industries allows Georgia companies to lead the agricultural use of UAS and the state can be the hub for design, manufacturing, and training.

What the Centers of Innovation offer the aerospace and agribusiness industries:

- Industry experience staff that provides expertise, and connects businesses to new technologies, research, business partners and industry trends.
- Collaboration of leaders from academia, business and government.

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how to market the use of UAS technology to farmers and crop consultants, and how to capture, analyze and relay valuable data for crop management programs to increase crop yield.

In order to reach its goal to create a viable business model and market UAS technology to farmers, GST required strategic partners with which to obtain a Certificate of Authorization, find the farmland and crops to be tested, and connect with agricultural experts who could analyze UAS-collected data.

SOLUTION

Under the umbrella of the Georgia Department of Economic Development, the Centers of Innovation for Aerospace and Agribusiness worked together to provide deep technical expertise, connections and innovative solutions to help GST reach its goals. Most importantly, the Centers were able to bring together the right combination of business, academic and government resources to ensure that GST could collaborate in research needed to become a leader in this market. Executives from the Centers made significant connections to public academic organizations that could partner with GST for the logistics, funding and analysis of said research.

RESULTS

The Centers of Innovation for Aerospace and Agribusiness, assembled a team of strategic partners from across Georgia, including Guided Systems Technologies, to perform a months-long project to refine their understanding of potential future UAS product and services offerings.

Funding for the project included: a $106,000 in-kind contribution from GST for the leasing, support and insurance of the two test UAS helicopters; $5,000 from both the Georgia Cotton Commission and the Peanut Commission to cover the research costs and staff times for the planting of crops; and a $100,000 grant from both of the Centers of Innovation to Middle Georgia State College to conduct the research.

> “The Georgia Centers of Innovation for both Aerospace and Agribusiness were vital in establishing the research program that fostered our understanding of UAS applications for a whole new market - agriculture.”
>
> – Eric Corban, Founder and Chief Technology Officer
> Guided Systems Technologies

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