Universities off to a flying start with large drone research project

July 11 2016, by Whitney Harder

Credit: University of Kentucky

Nearly 100 researchers and students from four universities, including the University of Kentucky, converged in Stillwater, Oklahoma, recently to do what they do best—fly unmanned aircraft systems (UAS), otherwise

known as drone systems.

The groups from UK, Oklahoma State University (OSU), the University of Oklahoma (OU) and University of Nebraska-Lincoln were conducting their first flight campaign for CLOUD MAP, the $6 million NSF-funded project focused on using drones for improved precision agriculture and weather forecasting.

"It was a great opportunity as a student to learn and practice engineering skills; for UK to work closely with other schools; and for science to accomplish goals that very few have even attempted," said Rob Singler, a mechanical engineering student who attended the weeklong campaign.

With weather cooperating all week, UK flew 70 successful flights of nearly 250 total campaign flights testing different technologies. All UK flights were conducted per Federal Aviation Administration regulations under UK's blanket certificate of authorization.

"This flight campaign—the world's largest gathering of atmospheric science and UAS researchers to date—exceeded everyone's expectations," said UK College of Engineering's Suzanne Smith, director of the UK Unmanned Systems Research Consortium and principal investigator of UK's efforts in the project.

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UK faculty, staff and students from the departments of mechanical engineering, biosystems and agricultural engineering and chemistry attended the campaign, which included a tour of the National Weather Center.

After 17 faculty investigators presented their research to more than 80 faculty, staff and students in attendance, "ideas started coming immediately as we witnessed the potential of this technology all together in one place," Smith said.

On the first full testing day, Smith said many were already imagining the possibilities of the research when working together for a second year—"and 2017 is only year two of this four-year project."

Collaboration kept the team flying high all week. UK's Sean Bailey and OU's Phil Chilson conceived joint test flights with two UK fixed-wing sensor platforms and OU's rotorcraft platform. UK's Michael Sama collaborated with OSU's Amy Frazier, sharing ground reference targets viewed with his multispectral imaging sensors.

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Many joint exercises were conducted with the flights, allowing teams to compare sensor measurements and analyze which sensors could complement each other. Researchers also flew their UAS around an Oklahoma Mesonet site where high-quality reference weather and ground moisture data is available.

"Now there is much data to evaluate and analyze over the next several months," Smith said.

A tour of the National Weather Center and the OU Advanced Radar Research Center completed the outstanding week for all.

The excitement of their accomplishments and collaborations is sure to energize the students and faculty as they work toward the next CLOUD MAP Flight Campaign tentatively scheduled for July 10-14, 2017, again in Stillwater. The 2018 flight campaign is planned for Kentucky.

Provided by University of Kentucky

Citation: Universities off to a flying start with large drone research project (2016, July 11) retrieved 25 April 2024 from https://phys.org/news/2016-07-universities-large-drone.html