Creating green aviation technology

March 31 2011, By Heather L. Ogletree

"Green" research has become a burgeoning field at NASA, and Ames Research Center in Moffett Field, Calif., is definitely on board. Scientists, engineers and researchers at Ames conduct a variety of green projects in relation to aviation. “Green is not just a buzzword to us,” said NASA Administrator Charles Bolden at Ames' Green Aviation Summit last September.

This fall, the Undergraduate Student Research Program (USRP), teamed Daniel Alexander II with NASA mentor Greg Hornby to complete a 15-week hands-on experience at Ames concerning green aviation research. The project was entitled, “Formation Flight for the National Airspace.”

Hornby explained, “To meet government-mandated energy efficiency goals in commercial aviation in the National Airspace (NAS), one proposed approach to improve fuel efficiency whilst simultaneously reducing air traffic complexity is to fly aircraft in formations.”

Alexander added, “I had to recreate a tool that handled aircraft data and used it to calculate air traffic congestion.” He then would “update it so that aircraft’s trajectories could be altered to fly in formation” so he could “see what effects it has on fuel consumption and the aforementioned congestion.”

Hornby indicated that formation flying reduces drag, which makes for more efficient fuel use. In fact, this project was conceived “to determine how much of the 15 to 20 percent fuel savings in paired formations can

be achieved for a NAS-wide implementation of formation flying."

Before arriving at Ames, the computer science major from Michigan State University did not realize that NASA conducted research outside of aeronautics and space. "I kind of scoffed when my parents said that I would have a job at NASA....Unfortunately, me being here means that I have to succumb to the idea that my parents aren't completely crazy," commented Alexander.

Alexander's prior experience consisted of three internships in the fields of gaming, web development and embedded system programming. So when he came into the field of aviation software development, he likened the experience to "drinking from a fire hose." He noted, "That resulted in some frustrations, but the end result was well worth the effort. Seeing a project go from concept to design to code to a workable solution is a great feeling."

Upon graduation, Alexander does not plan to pursue his master's degree right away. However, he does plan on working in the STEM industry to get a feel for what he wants to specialize in when he does attend graduate school.

"The best part of the project is when it is finally complete," said Alexander in reference to his USRP internship. "At that point, I can say to myself that I built it and, by some miracle, it actually works."

Provided by JPL/NASA

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