Student Seminar



& GAMECOCK MATH CLUB

## Mathematics, Formal Methods, and Drones

## by Aaron Dutle Research Computer Scientist, NASA



Aaron Dutle

The unmanned aircraft market is one of the fastest growing sectors in the world today, poised to become a billion dollar industry in the next several years. This explosive growth in drone air traffic brings an increased risk of these vehicles interfering with current air traffic, or harming unsuspecting bystanders. Researchers at NASA are working on ways to keep the airspace safe, while allowing drone operators the freedom to fly independently. This talk will cover some of the mathematics underlying a pair of drone safety applications under development at NASA's Langley Research Center, and how Formal Methods are used to assure that they perform as they are intended. The first, called Safeguard, is a system for keeping drones inside or outside of a specific geographical area. The second, called DAIDALUS, is a software suite for providing situational awareness and maneuvering advice for unmanned aircraft.

Dr. Aaron Dutle is a Research Computer Scientist working in the Safety-Critical Avionics Systems Branch at NASA's Langley Research Center since 2014. He recieved his Ph.D in Mathematics from the University of South Carolina in 2012 under Dr. Joshua Cooper, and remained at the university for two years as a postdoctoral researcher under Drs. Éva Czabarka and László Székely.

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