

## Grant Bauer

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*Mentor: Austin Murch, AEM*

Department

## *Unmanned Aerial Vehicle UROP*

The University of Minnesota's UAV Research Group focuses on developing low-cost, open source avionics and software for unmanned aerial vehicles. For continued progress to be made, the existing electronics needed to be upgraded in order to increase the UAV's flight capability. The previous avionics architecture lacked the capability to measure of the aircraft control surface positions. The goal of this UROP was to investigate the use of low-cost commercial-off-the-shelf (COTS) sensors to fill the aforementioned capability gap, followed by the integration, testing, and calibration of the sensors themselves. After successfully incorporating these sensors into the UAV's avionics architecture, the plane is now able to transmit the angle of attack of each of its six control surfaces to the ground station in mid-flight. This then allows the research group to attain more accurate flight data from the plane and more easily detect anomalies, like servo faults, that disrupt the plane's flight characteristics. Since the UAV Research Group has an open source policy, much of the progress made by the group as a whole will help enable widespread civilian use of UAV's for applications like law enforcement, aerial photography and surveying, and atmospheric sensing.



Poster Number:      Session: