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Autonomous Aerial Radio Frequency Source Geolocation

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Abstract: The United States strives to develop cutting edge technology and minimize deficiencies. Because of GPS's limitations, the Department of Defense is working with the Department of Energy to develop independent geolocation assets. To meet this need, two search path algorithms were developed to locate the source signal in a simulation. The two methods used for the algorithms were a gradient search method and an interdisciplinary method based on glider thermalling techniques. Ground tests showed the viability of the algorithms being able to geolocate the source in a real environment. Flight tests showed the reality of the entire system working in conjunction to autonomously geolocate the source of a radio frequency.

Keywords: Geolocation, Gradient Search, Thermalling, Drone, UAS, asset location, autonomous and navigation