

## Graduation Design Project Proposal Form

Project # C7

<b>Project Title:</b> The Detection, Characterization, and Defense of Commercial Drone Operations Using Electronic Surveillance and Countermeasure Techniques
<b>Professor(s) Name(s):</b> Dr. Sami Mohammed Alhumaidi
<b>Number of Students:</b> Two
<b>Students Qualifications:</b> Communications minor with high grades in comms, electromagnetic, and antenna courses.
<b>Statement of Problem</b> Small commercial drones are spreading quickly and being used without licenses around sensitive locations. They impose a great threat to high-value asset facilities and security/defense locations. They can be used by adversaries to illegally collect intelligence and can deliver harmful payloads.
<b>Brief Description of the Project</b> In this project, we will attempt to study and analyze the communications and signaling protocols of commercial drones. We will measure and analyze and categorize transmissions from airborne and RC units. SDR-based hardware receivers will be built and optimized for detection and identification of drone operations. A TX channel will be used to assess the type and level of RF emissions that can be used to counter drone operation and prevent it from reaching its target.
<b>Objectives</b> <ol style="list-style-type: none"><li>(1) Study, analyze and characterize drone communication and signaling,</li><li>(2) develop SDR-based receiver array for detection and identification drone operation, and</li><li>(3) test viability and effectiveness of RF countermeasure.</li></ol>
<b>Technical Approach and Expected Deliverables</b> The projects aims to produce the following deliverables: <ol style="list-style-type: none"><li>(1) A comprehensive report describing, analyze and characterize drone communication and signaling.</li><li>(2) An SDR-based receiver array.</li><li>(3) An SDR-based transmitter.</li><li>(4) Situational awareness and command and control software to control system operation</li></ol>