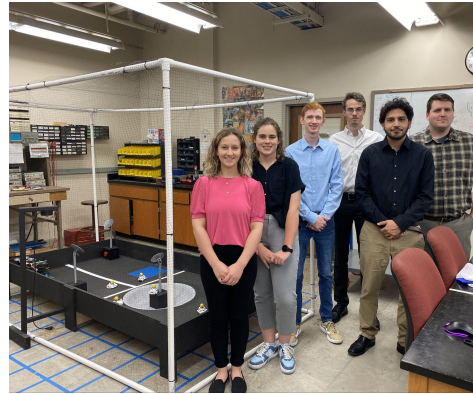


2026 IEEE SoutheastCon Hardware Competition Ruleset

UAH ECE Senior Design Project

Overview

IEEE Region 3 hosts a hardware competition every year at their annual SoutheastCon. Each competition has a theme determined by the host city. In 2026 it will be hosted here in Huntsville. In preparation for that our group, Kircoff's Disciples, was tasked with developing the ruleset for that competition. The group consists of Lily Compher, Ryan Cagle, Maggie Watlton, Alex Cloer, Eric Arreola, and Alex Pointer



“In a galaxy far far away a group of Astro-jedi-ducks have been stranded on the planet of Scarif. The group of Jedis were on a top secret mission to find key information which was being reported to a rebel spy on the Death Star. Now, they are abandoned with no method of communication. In order to save the day, a group of rebels has been tasked with rescuing the Jedis, restoring the antennas, and getting the Millenium Falcon to restore communication with the rebel spy”

This is the prompt that we have created for the theme of this competition. The robot will start in the green area and go throughout the course restoring power to the four antennas throughout the board. The antenna's power is restored by completing a unique task on each antenna. These tasks include crack, a keypad password, a button, and a pressure sensor that needs to have the Astro-jedi-duck removed. Completion of the tasks turns on the LEDs in the dome of the antenna. The drone will read the color it emits and relay that information to the Death Star. Then all of the Astro-jedi-ducks will need to be moved to the blue area on the board. All of this will need to be done in three minutes and points will be given for completing tasks.

Tech Specs

In order to complete the task we were given we built each part of the competition that we were creating from the ground up. The antennas, crater, and the Death Star were all 3-D printed. Each of the antennas has an LED that emits one of 4 colors, blue, green, red, and purple. At the base, the antenna has a sliding door that gives us access to the wiring. Each antenna is powered by a 9 Volt battery and is controlled by an Arduino Nano. Outside the board hangs the Death Star. The Death Star is controlled by an Arduino Uno and powered by a battery shield. A LCD and photodiode is mounted on the outside of the Death Star. The photodiode, which uses a comparator to reduce noise, receives the signal from the Millennium Falcon, or UAV.

The Millennium Falcon is controlled by an application called Tello. To program it we used a DJI Tello Drone Python interface using the official Tello SDK, which is a library with the corresponding commands to receive livestream and control the movement of the drone. It has an IR diode connected to UART that is attached to the top and bottom of the drone so that it can send the data to the photodiode on the Death Star.