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P2: Construction of Weather Station for Measuring Wind using a Hovering Drone Network

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Construction of A Weather Station for Measuring Wind using a Hovering Drone Network

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Abstract

Our research aims to build and test the effectiveness of the Sparkfun® Weather Station in its ability to record meaningful data while streaming to a remote device in real-time. This is motivated by our plans to utilize a hovering-drone system to collect meteorological data, such as wind speed, wind direction, humidity, pressure, and temperature. This data is essential to evaluate the wind profiles of a given area and assess available wind resource. The weather station was first calibrated by comparing measurements of the cup anemometer against a standard pitot tube in the lab. We found that the measured wind speed from the cup anemometer needs to be corrected with a factor of 1.4 as wind speed is below 4.5 m/s, but no correction is needed beyond. Overall, the easily-upgradable Sparkfun® Weather Station has been found to be an effective and inexpensive way to collect meteorological data wirelessly. The next step of this research is to incorporate the weather station into the hovering drone to enable measuring wind using a hovering drone network.