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## INTEGRATION OF A FLUXGATE MAGNETOMETER AND GPS SYSTEM INTO AN UNMANNED AIRCRAFT SYSTEM

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Magnetic method has been widely used for exploration of magnetic minerals or rocks and the detection of artificial objects such as unexploded ordinances (UXOs). However, a ground-based magnetic survey is time-consuming. Aeromagnetic surveys will be faster and more efficient. In this project, we integrated a fluxgate magnetometer and GPS units with an unmanned aerial vehicle (UAV), i.e., Matrice 600 Pro, to measure magnetic anomalies for aero-geophysical exploration. To achieve this objective, we used an Arduino microprocessor to control a triaxial fluxgate magnetometer (FGM-301/310) and two GPS units (ANT-GPS-SH-SMA). Arduino IDE codes were written for simultaneous data collection from the magnetometer and the two GPS antennas and for storing the data to a microSD card. These components will be attached to the DJI Matrice 600 Pro UAV. The whole system will be tested using a UXO sample. We will fly the UAS with the magnetometer over a sample UXO. With the two GPS antennas, the location and orientation of the magnetometer is obtained so that the three components of the magnetic field can be calculated. The data collected will be processed to create a georeferenced map of magnetic fields and will be interpreted. The accuracy of the fluxgate magnetometer and UAV system will be evaluated.