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## Using Aerial Multispectral Remote Sensing to Detect Changes to the Built Environment and Natural Systems

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## Using Aerial Multispectral Remote Sensing to Detect Changes to the Built Environment and Natural Systems

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**Abstract:** We are conducting monthly experiments and collecting spectral data using an Unmanned Aircraft System (UAS) mounted multispectral sensor for the University of Texas at El Paso (UTEP) campus. The high-resolution (approximately 7cm/px) data collected is being processed to develop orthomosaic for five bands (centers at 475nm, 560nm, 668 nm, 840nm, and 717nm) based on orthorectification for the approximately 1.7 Km<sup>2</sup> UTEP campus. The data is being processed using Python image processing libraries to assess changes in the Built Environment (BE) and the Natural Systems (NS) for the campus. So far, we have been able to detect changes in vegetation and monitor a construction project on the campus. Experiments are ongoing to use machine learning methods and assess changes to the bare soil, vegetation, roofing material, and buildings in the campus. In these paper, we will present out methods for data acquisition, storage, and processing for this massive data, lessons learned, and some results from the ongoing experiments.

**Keywords:** Built Environment; Natural Systems; Multispectral Sensor; Orthomosaic; Image Processing