

Overview of the Uncrewed Aircraft System (UAS) Campus Survey Project at Texas A&M University-Corpus Christi

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SUMMARY

The use of Unoccupied Aircraft Systems (UAS) for surveying at Texas A&M University-Corpus Christi (TAMUCC) began in 2013, during the university's expansion project. A Sensefly eBee fixed-wing UAS equipped with a 12 MP digital camera was initially used for comparison with traditional land surveying methods, such as survey-grade RTK GPS and total stations. The results showed that the UAS survey products achieved near-survey grade elevation accuracy with the use of a rigorous ground control point network. Additionally, the GIS products created from the overlapping image sets, such as orthomosaic, were valuable for various campus needs, including campus police and facilities. Recognizing the potential of these datasets, TAMUCC's UAS campus survey project was launched in 2014 and funded by the University Operations Division. The project was led by the Measurement Analytics Lab (MANTIS) and primarily run by TAMUCC geomatics students, with faculty oversight and a remote pilot in command. The project's objective is to conduct repeat UAS surveys of the TAMUCC Ward Island and Momentum campuses at quarterly to biannual rates. This study will provide a historical perspective of the TAMUCC UAS campus survey project, including advancements in data acquisition platforms and capabilities, data acquisition methods and ground control approaches employed, SfM processing workflows, and examples of UAS survey products, object detection using deep learning in UAS survey products, a web-based geoportal approach for data distribution and visualization, and examples of UAS applications in support of campus surveying and geoinformatics needs.

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