

UAV Surveying for Environmental Studies

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Key words: Photogrammetry; Remote sensing; Risk management; UAV; Geospatial, deep learning

SUMMARY

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Unmanned aerial vehicles (UAV) has become a proven technology for environmental monitoring and can fill the gap between conventional field surveying and satellite remote sensing for data collection. Especially it plays an increasingly important role in acquiring data for natural disaster management such as flooding to support emergency-response planning during the event and assessing damage in spatial and temporal measurements. UAVs can acquire high-resolution imagery or video with flexibility in the frequency and time of data acquisition to map and monitor flooding. In addition, their versatility, adaptability, and flexibility make them an essential tool for flood study. In contrast, their short flight endurance and small-scale coverage remain areas of weakness for their wide-scale implementation in remote sensing. The study developed an integration of deep learning and geospatial method to map floods using UAV imagery and ground survey data. The UAV data is used to create a flood extent map using deep learning while ground surveying data is used for georeferencing and validation purposes. the study used Hurricane Matthew and Hurricane Florence UAV data acquired over the city of Princeville, North Carolina, to train and test the deep learning method. This approach achieved about 98% accuracy in mapping inundation areas using UAV data and demonstrated that UAVs could be effectively used for accurate and timely flood mapping.

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Keywords: Surveying, disaster mapping, geospatial, land-use, UAV

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