Detection and Estimation of Inundation and Associated Risks Using Traffic and Monitoring Cameras and Image Processing Under Extreme Flooding Conditions Dataset

Dataset available at: https://doi.org/10.5281/zenodo.4270673

(This dataset supports report **Detection and Estimation of Inundation and Associated Risks Using Traffic Monitoring Cameras and Image Processing Under Extreme Flooding Conditions**)

This U.S. Department of Transportation-funded dataset is preserved in the Zenodo Repository (https://zenodo.org/), and is available at https://doi.org/10.5281/zenodo.4270673

The related final report **Detection and Estimation of Inundation and Associated Risks Using Traffic Monitoring Cameras and Image Processing Under Extreme Flooding Conditions**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/58888.

Metadata from the Zenodo Repository record:

Title: Detection and Estimation of Inundation and Associated Risks Using Traffic and Monitoring Cameras and Image Processing Under Extreme Flooding Conditions

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Description: The main objective of this project is to develop an inundation detection and evaluation framework using images from traffic monitoring cameras and reliable flood monitoring under extreme precipitation conditions. This study presents a comparative assessment of image enhancement and segmentation techniques to automatically identify the flash flooding from the low-resolution images taken by traffic-monitoring cameras. Due to inaccurate equipment in severe weather conditions (e.g., raindrops or light refraction on camera lenses), low-resolution images are subject to noises that degrade the quality of information. De-noising procedures are carried out for the enhancement of images by removing different types of noises. After the de-noising, image segmentation is implemented to detect the inundation from the images automatically. In addition, the detection of the inundation using the image segmentation with and without de-noising techniques are compared. The results indicate that among de-noising methods, the Bayes shrink with the thresholding discrete wavelet transform shows the most reliable result. For the image segmentation, the Bayesian segmentation is superior to the others. The results demonstrate that the proposed image enhancement and segmentation methods can be effectively used to identify the inundation from low-resolution images taken in severe weather conditions. A new Bayesian filtering method will be devised and applied to estimate the inundation from low-resolution images that will allow traffic engineers to take preventive or proactive actions to improve the safety of drivers and protect and preserve the transportation infrastructure. This new observation with improved accuracy will enhance our understanding of dynamic urban flooding by filling an information gap in the locations where conventional observations have limitations.

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Dataset description:
This dataset contains 1 file described below.

19SAUTA04_Data.xlsx:
The .xlsx file type is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.

National Transportation Library (NTL) Curation Note:
As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (https://ntl.bts.gov/public-access) Section 7.4.2 Data, the NTL staff has performed ***NO*** additional curation actions on this dataset. NTL staff last accessed this dataset at https://doi.org/10.5281/zenodo.4270673 on 2022-01-12. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.