

A Deep Learning Based Integrated Model For Spatial Flood Prediction

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Abstract : The research introduces an integrated prediction model to assess the susceptibility of roads in a future flooding event. The model consists of deep learning algorithm for forecasting gauge height data and Flood Inundation Mapper (FIM) for spatial flooding. An optimal architecture for Long short-term memory network (LSTM) was identified for the gauge located on Tangipahoa River at Robert, LA. Dropout was applied to the model to evaluate the uncertainty associated with the predictions. The estimates are then used along with FIM to identify the spatial flooding. Further geoprocessing in ArcGIS provides the susceptibility values for different roads. The model was validated based on the devastating flood of August 2016. The paper discusses the challenges for generalization the methodology for other locations and also for various types of flooding. The developed model can be used by the transportation department and other emergency response organizations for effective disaster management.

Keywords : deep learning, disaster management, flood prediction, urban flooding

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