

Flood-prone Urban Area Mapping Using Machine Learning, a Case Study of M'sila City (Algeria)

Authors : Medjadj Tarek, Ghribi Hayet

Abstract : This study aims to develop a flood sensitivity assessment tool using machine learning (ML) techniques and geographic information system (GIS). The importance of this study is integrating the geographic information systems (GIS) and machine learning (ML) techniques for mapping flood risks, which help decision-makers to identify the most vulnerable areas and take the necessary precautions to face this type of natural disaster. To reach this goal, we will study the case of the city of M'sila, which is among the areas most vulnerable to floods. This study drew a map of flood-prone areas based on the methodology where we have made a comparison between 3 machine learning algorithms: the xGboost model, the Random Forest algorithm and the K Nearest Neighbour algorithm. Each of them gave an accuracy respectively of 97.92 - 95 - 93.75. In the process of mapping flood-prone areas, the first model was relied upon, which gave the greatest accuracy (xGboost).

Keywords : Geographic information systems (GIS), machine learning (ML), emergency mapping, flood disaster management

Conference Title : ICGESS 2023 : International Conference on Geography, Environment and Spatial Sciences

Conference Location : Rome, Italy

Conference Dates : April 13-14, 2023