**Flood forecasting Flood forecasting Flood forecasting** is the use of forecasted [precipitation](https://en.wikipedia.org/wiki/Precipitation_(meteorology)) and [streamflow](https://en.wikipedia.org/wiki/Streamflow) data in [rainfall-runoff](https://en.wikipedia.org/wiki/Runoff_model) and [streamflow routing](https://en.wikipedia.org/w/index.php?title=Streamflow_routing&action=edit&redlink=1) models to forecast flow rates and water levels for periods ranging from a few hours to days ahead, depending on the size of the watershed or [river basin](https://en.wikipedia.org/wiki/Drainage_basin).[[1]](https://en.wikipedia.org/wiki/Flood_forecasting#cite_note-1) Flood forecasting can also make use of forecasts of precipitation in an attempt to extend the lead-time available.

Flood forecasting is an important component of [flood warning](https://en.wikipedia.org/wiki/Flood_warning), where the distinction between the two is that the outcome of flood forecasting is a set of forecast time-profiles of channel flows or river levels at various locations, while "flood warning" is the task of making use of these forecasts to tell decisions on warnings of floods.

Real-time flood forecasting at regional area can be done within seconds by using the technology of artificial neural network.[[2]](https://en.wikipedia.org/wiki/Flood_forecasting#cite_note-2) Effective real-time flood forecasting models could be useful for early warning and disaster prevention

**flood prediction -**The study of rainfall patterns, catchment characteristics, and river hydrographs to predict the future average frequency of occurrence of flood events. Flood predictions seek to estimate the probable discharge that, on average, will be exceeded only once in any particular period, hence the use of such terms as ‘50-year flood’ and ‘100-year flood’. Compare FLOOD FORECASTING

Disaster prevention and prediction Flood prediction using machine learning approach.

Proposed solution:

1)PREDICTION: APPROACH 1: A dataset with the amount of rainfall and if a flood had occured in a particular area/state/city, in the previous years, will be used. The dataset will have the rainfall data for a duration of 3 months approx.

Using this dataset, we take average rainfall for every 10 days and plot it on a graph to visualize it. We take this average data of rainfall, as input to our machine learning model and if it causes a flood or not as the output labels. We train our model and save it.(depending on some threshold value of average rainfall in the dataset)

Given the input data, for consecutive 10 days, we give this data as an input, and let the model predict, if whether there is a possibility of flooding or not, by setting some threshold in the training data. Our basic approach for this problem is binary classification, using basic machine learning algorithms(linear regression or logistic regression).

This approach can be made real time prediction and accuracy can be improved with adding more features such as the type of land in that area, the location of the area etc.

APPROACH 2: There is an official website called [www.india-water.gov.in](http://www.india-water.gov.in/) , which updates itself regularly saying whether the water level in a particular area is 1)above normal flood, 2)severe flooded or 3)extremely flooded (with yellow,orange and red colour respectively).

We plan to scrap data out from this webpage from time to time and store it in a database.

2)SENDING WARNING: The database will be accessed and red alert warning will be sent to the mobile phones of all the people in the effected area, using a free online text message sending portal.

2) The goal of this project is to see if natural disasters (such as fires and floods) can be effectively used as artistic styles. That is, can we **visually predict what a natural disaster may look like**?

1) We gathered before and after images for 28 flooded locations. One image was used as a "style" image (representing a typical flood) to apply to other location's before images. We generated output images which serve as compromises between before-image content and style-image style, and then compared these output images (via the same unweighted loss functions) to the true after images

2) Artistic style transfer utilizes a pretrained convolutional neural network, therefore there is no "training"; parameters are not tuned, only hyperparameters (such as loss function tradeoff and neural style depth) are. We found the hyperparameter combinations which minimize the loss/error between output images and 20 post-flood images, then used this combination to evaluate performance on 7 test set images. The model-generated outputs of which are below

EVALUATION

Overall the results are pretty impressive! Notably, however, the model will not "add water". Our model primarily gives the scenes a muddy and eroded appearance, suggesting that we are more reasonably predicting the aftermath (rather than the presence) of a flood. Due to this, the predictions are less impression on locations which lack abundant plant life.

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