EP3.

INTELLIGENT WEATHER FORECASTING SYSTEM

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Over the past two decades, there had been a substantial accumulation of knowledge on the handling of satellite data to forecast and estimate rainfall. Nevertheless, despite the use of modern computer systems, typically, at least thirty minutes is required to obtain a rainfall estimate. Moreover, the average error in forecasting a rainfall event is about 30%. Considering these facts and the "learning capabilities" of neural network models, it is appropriate to investigate the possibility of forecasting weather using a neural network model. There have been numerous research work carried out on this theme before, but here we present a novel approach.

Feed Forward Neural Network models have been used for some time in weather forecasting so that fixed-point rainfall estimates, maximum isohyet area-rainfall estimates and total area-rainfall estimates can be analyzed. Input data to these neural network models are based on actual satellite data and past experience, that is, real rainfall events of previous years. The intelligent weather forecasting system proposed here depends on an Artificial Neural Network (ANN) model, where the input data are based on actual satellite data, past experience, as well as, the deviations of satellite based rainfall estimates from the real rainfall events and partially known satellite data. More explicitly, the input data to the proposed ANN model are cloud top temperature, cloud growth factor, rain burst factor, overshooting top factor, merger factor, saturated environment factor, moisture correction and the speeds of storms. Since, the state input, which is based on the deviations of the satellite based rainfall estimates from the actual rainfalls is also considered, it is necessary to have a context layer with the input layer. The output of the ANN model considered will be an estimate of the rainfall along with the error for the given period. During the "learning" stage of the model, it is necessary to store past experiences, as much as possible, in order to predict rainfall events accurately with the available satellite data and/or partially known satellite data.

We conclude that the ANN approach for weather forecasting, in contrast to the conventional methods, yields results faster with a better error margin.