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Precipitation Nowcasting using Deep Neural Network

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Precipitation nowcasting is the prediction of the future precipitation rate in a given geographical region with an anticipation time of a few hours at most. It is of great importance for weather forecast users, for activitites ranging from outdoor activities and sports competitions to airport traffic management. In contrast to long-term precipitation forecasts which are traditionally obtained from numerical weather prediction models, precipitation nowcasting needs to be very fast. It is therefore more challenging to obtain because of this time constraint. Recently, many machine learning based methods had been proposed. In this work, we develop an original deep learning approach. We formulate precipitation nowcasting issue as a video prediction problem where both input and prediction target are image sequences. The proposed model combines a Long Short-Term Memory network (LSTM) with a convolutional encoder-decoder network (U-net). Experiments show that our method captures spatiotemporal correlations and yields meaningful forecasts