

Using deep generative radar models to predict rainfall over following 90 minutes

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A team of researchers at Google's DeepMind, working with a group at the U.K.'s Met Office, has applied their knowledge of deep learning methods to the science of "nowcasting"—predicting whether it will rain in a given place in the following two hours. In their paper published in the journal *Nature*, the group describes applying deep learning to

weather forecasting and how well the system compared to traditional tools.

Over the past several decades, [weather forecasts](#) have improved at predicting whether it will rain or not—but they still have a long way to go. The current method of forecasting involves the use of supercomputers to crunch massive amounts of atmospheric data, and most [weather](#) forecasters agree that such systems are good at predicting long-term weather patterns.

Unfortunately, short-term forecasting is still not advanced. Of particular interest is the problem of forecasting whether it will rain in a given area in the following two hours, and how much. To be sure, some [short-term forecasts](#) are easy to predict—when large rainclouds cover hundreds of miles, everyone is going to get wet. It is the [forecast](#) of thunderstorms that is difficult because the amount of water they contain varies as time passes and because their shapes shift as they move over land. Thus, nowcasting remains, as the researchers note, "a substantial challenge."

In this new effort, the researchers applied a [deep-learning network](#) called Deep Generative Model of Rainfall (DGMR) to the problem. It uses what they describe as, naturally enough, generative modeling. Like other deep-learning systems, it works by analyzing data describing patterns—in this case weather patterns—as they have evolved over time, and uses that information to make predictions 90 minutes into the future. The data for the project was supplied by the Met Office, the U.K.'s national weather service.

The researchers tested the accuracy of DGMR by asking 56 weather forecasters to compare its predictions with those made by traditional forecasting tools—89% of them preferred DGMR because they found it more reliable. The researchers suggest that AI could be a powerful new tool to improve weather predictions.

More information: Suman Ravuri et al, Skilful precipitation nowcasting using deep generative models of radar, *Nature* (2021). [DOI: 10.1038/s41586-021-03854-z](https://doi.org/10.1038/s41586-021-03854-z)

Nowcasting the Next Hour of Rain:
deepmind.com/blog/article/nowcasting

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