

Researchers create AI algorithm to detect cloud formations that lead to storms

By **saaurabhjoshi** - July 8, 2019



Scientists have developed an **Artificial Intelligence(AI)** digital process to detect cloud formations that lead to storms, hurricanes and cyclones. The study was published in *IEEE Transactions on Geoscience and Remote Sensing* which shows a model that can help forecasters by recognising potential severe storms more quickly and accurately.

The researchers created a model based on Machine Learning (ML), a kind of AI that analyzes rotational movements in clouds from satellite images that might have otherwise gone unnoticed.

"The very best forecasting incorporates as much data as possible, there's so much data that the atmosphere is infinitely complex. By using the models and the data we have, we get a snapshot of the most complete look of the atmosphere," said Steve Wistar, Senior Meteorologist at AccuWeather in the US.

In their study, the researchers worked with Wistar and other meteorologists to analyze more than 50,000 historical U.S. weather satellite images. In them, experts identified the shape and motion of "comma-shaped" clouds. These cloud patterns are strongly associated with the formation of severe storms.

cyclone formations, which can lead to severe weather events including hail, thun
winds, and blizzards.

Researchers then used computer vision and machine learning techniques, to aut
recognize and detect comma-shaped clouds in satellite images. The computers c
experts by pointing out in a real-time where, in an ocean of data, could they foc
in order to detect the onset of severe weather.

*"Because the comma-shaped cloud is a visual indicator of severe weather events
can help meteorologists forecast such events,"* said Rachel Zheng, a doctoral stu
College of Information Sciences and Technology at Penn State and the main rese
project.

This project enhances earlier work between AccuWeather and a College of IST re
by professor James Wang, who is the dissertation adviser of Zheng.

*"We recognized when our collaboration began [with AccuWeather in 2010] that a
challenge facing meteorologists and climatologists was in making sense of the va
continually increasing amount of data generated by Earth observation satellites,
sensor networks,"* said Wang. *"It is essential to have computerized systems anal
from the data so we can provide timely and proper interpretation of the data in t
applications such as severe-weather forecasting."*

He added, *"This research is an early attempt to show feasibility of artificial intelli
interpretation of weather-related visual information to the research community.
integrate this approach with existing numerical weather-prediction models and o
models will likely make the weather forecast more accurate and useful to people*

Concluded Wistar, *"The benefit [of this research] is calling the attention of a ver
to something that may have otherwise been overlooked."*

saurabhjoshi