IIT-I's 'AeroVision' to forecast air quality of next 6 days

Our Staff Reporter

INDORE

Indian Institute of Technology Indore has developed a breakthrough technology, AeroVision, which works like a weather forecast system—but instead of predicting rain, it forecasts air quality for the next six days in every city and town of India.

Developed by Prof Manish Kumar Goyal and his research team, including Kuldeep Singh Rautela from the Department of Civil Engineering, AeroVision is powered by advanced Artificial Intelligence combining Convolutional Neural Networks (CNN), Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRU).

It also collects weather information such as temperature, rainfall, wind speed, air pressure, and humidity, as well as atmospheric conditions like how high pollution can rise in the atmosphere and how many hours of sunshine are available. This data is collected hourly from a 25-kilometer grid across different regions.

IIT Indore Director Prof Suhas Joshi said, "AeroVision is a step towards empowering citizens with the ability to foresee and mitigate the health impacts of air pollution. By providing reliable, location-specific forecasts, it aligns with our vision of using science and technology for societal well-being and sustainable living."

AeroVision predicts levels of six key pollutants
- M2.5, PM10, CO,
- SO2, NO2 and O3
- Accuracy consistently above 95%

The technology analysis 12 years of hourly air quality data along with weather and atmospheric information to arrive at the results

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Prof Goyal said, "This system converts complex pollution data into a simple, colour-coded Air Quality Index (AQI) following Indian standards, along with health warnings and activity recommendations. It enables individuals, communities, and policymakers to plan outdoor activities, take preventive health measures, and respond to pollution events in advance."

This AQI works like a traffic light system: Green (0-50) indicates good air quality, Yellow (51-100) is moderate but requires caution for sensitive people, Orange (101-200) is unhealthy for sensitive groups, Red (201-300) is unhealthy for everyone, and Purple (301+) is very unhealthy—outdoor activities should be avoided. With its nationwide coverage and high accuracy, AeroVision marks a significant leap in India's fight against air pollution.