

IIT-I develops AI-system to detect anomaly in structures, HT wires

TIMES NEWS NETWORK

Indore: The Indian Institute of Technology (IIT), Indore, has developed a system using the power of Artificial Intelligence (AI) and Machine Learning (ML) to detect cracks and other structural anomalies in real-time. This groundbreaking technology is poised to revolutionise the process of structural inspection, enhancing accuracy and efficiency in assessing the integrity of buildings, roads, and high-tension wires.

The project, a collaborative endeavour spearheaded by Professor Abhirup Datta, a faculty member at IIT-I, Kumar Sheshank Shekhar, student, Masters in Space Engineering and Ph.D. scholar Harsha Avinash Tanti, seamlessly integrates Un-

manned Aerial Vehicles (UAVs) with AI and ML algorithms to conduct comprehensive structural inspection and surveillance.

The UAVs are equipped with advanced cameras and LiDAR sensors, which synergistically provide detailed information about the location and size of any detected anomalies. The newly devised system can process data directly on the drone using edge computing, allowing for real-time decision-making. The drone's payload has been optimised to minimise space and power consumption, ensuring high performance and efficiency.

Professor Suhas Joshi, Director of IIT Indore, said, "This research work has made a significant breakthrough in the field of structural inspection and surveillance.

It has gained significant attention from experts, recognising its potential to advance inspection technology. As this system continues to be refined and applied, it is likely to have a significant impact on infrastructure monitoring and maintenance. This technology is particularly valuable for inspecting

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extensive road networks, cross-country gas pipelines, and high-tension power transmission lines. It has massive applications in the maintenance and surveillance of infrastructures like roads, power lines, etc., as well as in defence and space."

IIT-I claimed that the system has achieved a 98.7 per cent success rate in detec-

ting and classifying cracks and processing data in just 25 milliseconds using advanced AI edge devices like NVIDIA Jetson.

Professor Datta said, "This innovation is expected to transform the way inspections are conducted, making the process faster, safer, and more reliable. Moreover, the system's ability to categorise anomalies based on risk levels and report them in real-time to a ground station or inspection team is a unique advantage. This feature reduces the time and cost associated with maintenance and repairs. With its wide range of applications, including security and surveillance, this AI-enabled UAV system is set to become an essential tool in ensuring the safety and longevity of critical infrastructure."