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IIT-I develops DNA watermark tech to safeguard hardware IP

TIMES NEWS NETWORK

Indore: In a groundbreaking development for cybersecurity, the Indian Institute of Technology (IIT) Indore pioneered a novel DNA fingerprint watermarking technology aimed specifically at enhancing the protection of hardware Intellectual Property (IP) designs. With the rapid growth in technology and increasing threats to intellectual property, this innovation targets critical sectors including multimedia, medical devices, machine learning, and digital signal processing.

The development is led by Professor Anirban Sengupta and Translational Research Fellow Aditya Anshul. According to the statement released by IIT-I, the new system generates a unique DNA fingerprint tied to the identity of the IP vendor, which is then seamlessly embedded within the hardware design. This serves as a strong digital watermark, providing undeniable proof of ownership and a robust defence against piracy and fraudulent claims of ownership.

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Professor Suhas Joshi, director of IIT Indore, said, "This groundbreaking innovation from IIT Indore reflects our commitment to addressing real-world challenges through deep-tech research. Protecting intellectual property is vital, and this work signifies a major step in that direction."

The technology operates by fragmenting DNA-like sequences, replicating them, and integrating them into the hardware design, thus creating a highly distinct DNA signature. This unique signature is crucial for securing a range of complex hardware systems, including image processing units, JPEG-CODECs, and advanced machine learning accelerators. It is particularly beneficial for critical medical devices like QRS detectors for ECGs and cardiac pacemakers, as well as digital signal processing units.

Professor Sengupta, the Principal Investigator, said, "Our DNA-based watermarking technology introduces an innovative layer of cybersecurity for hardware IPs, ensuring that each design boasts a unique and verifiable identity. This advancement empowers IP vendors and designers to effectively guard their innovations against piracy and misuse in the global semiconductor ecosystem."