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(57) Abstract :
The present invention discloses an AI-enabled contextual data compression system for bandwidth-constrained IoT devices comprising a Contextual Analysis Module (101), Machine Learning Engine (102), Compression Unit (103), and Feedback Mechanism (104). The system intelligently prioritizes and compresses sensor data based on real-time contextual significance, thereby optimizing bandwidth usage and energy consumption. Through adaptive learning and continuous feedback, the system dynamically adjusts compression strategies to preserve high-priority information while reducing transmission of redundant data. The invention is scalable and suitable for diverse IoT applications with varying operational needs.

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