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(57) Abstract :
ARTIFICIAL INTELLIGENCE BASED SMART POWER GRID MANAGEMENT SYSTEM WITH DISTRIBUTED ENERGY RESOURCES INTEGRATION ABSTRACT The presented invention introduces an innovative method for effectively managing modern power grids integrated with distributed energy resources (DERs) through the utilization of artificial intelligence (AI). The method involves real-time data collection from a diverse range of DERs and grid components via a network of sensors and communication modules. This data is then processed and used to train an AI module employing advanced machine learning algorithms. The AI module generates predictive models to anticipate power demand, supply from DERs, energy storage requirements, and grid stability. Continual data updates enable the AI module to make real-time predictions, providing control recommendations that dynamically adjust energy production, consumption, and storage parameters of DERs. This AI-driven approach optimizes energy distribution, minimizes grid imbalances, and enhances overall stability. The invention provides a user interface for grid operators and end-users, facilitating informed decision-making for efficient energy utilization and grid management.

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