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(57) Abstract :
The present invention relates to an adaptive artificial intelligence (AI) framework designed for real-time decision-making in complex and dynamic environments. The framework integrates deep reinforcement learning, probabilistic reasoning, and meta-learning to enable continuous self-improvement and optimization of decision-making strategies based on real-time data streams. The system dynamically adapts to evolving conditions by analyzing multi-source data, recognizing patterns, and adjusting decision-making policies without requiring extensive retraining. It incorporates a probabilistic reasoning module for uncertainty management, an explainability module for transparent decision-making, and a modular architecture for seamless integration with enterprise systems. The framework is optimized for computational efficiency, allowing deployment in edge devices and resource-constrained environments. It is applicable across various industries, including finance, healthcare, cybersecurity, autonomous systems, and industrial automation. By offering real-time adaptability, enhanced accuracy, and multi-agent collaboration capabilities, the invention provides a scalable and intelligent solution for complex decision-making scenarios.

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