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Advancing innovation in financial stability: A comprehensive review of ai agent frameworks, challenges and applications

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Abstract Artificial Intelligence (AI) agents are revolutionizing industries by enabling autonomous decision-making, task execution, and multi-agent collaboration. This paper provides a comprehensive review of AI agent frameworks, focusing on their architectures, applications, and challenges in financial services. We conduct a comparative analysis of leading frameworks, including LangGraph, CrewAI, and AutoGen, evaluating their strengths, limitations, and suitability for complex financial tasks such as trading, risk assessment, and investment analysis. The integration of AI agents in financial markets presents both opportunities and challenges, particularly in terms of regulatory compliance, ethical considerations, and model robustness. We examine agentic AI design patterns, multi-agent systems, and the deployment of AI agents advancing the proposal to use them for fraud detection and risk management. By synthesizing insights from academic research and industry practices, this review identifies key trends and future directions in AI agent development. This work contributes to the growing discourse on AI-driven automation by outlining technical considerations and open challenges in deploying AI agents at scale. We highlight the need for enhanced transparency, interpretability, and security in AI-driven Agentic systems. Our findings provide valuable insights for researchers and practitioners seeking to harness AI agents for more efficient and intelligent decision-making.