

Summary Post

Summary Post

Summary Post

Display replies in nested form

Settings



Summary Post

by Fahad Abdallah - Friday, 15 August 2025, 5:16 PM

In my initial post, I discussed how agent-based systems (ABS) present a transition between monolithic systems and decentralised, adaptive, and intelligent systems that can exhibit autonomous behavior. I emphasised that ABS can react in real time, scale, and be resilient due to autonomous agents, making it appropriate to dynamically changing and complicated environments such as financial markets, traffic management, and supply chains (Ionescu et al., 2024). Emergent behavior can serve as a significant asset, enabling interactions at the micro level to generate predictions at the macro level, with distributed cognition helping enable distributed decision-making in such applications as smart grids and autonomous logistics. Besides making operations more efficient, ABS offers strategic insight, innovation, and formation of autonomous digital ecosystems (Rich et al., 2023).

Peers elaborated on the above. Abdulla Almessabi focused on the capability of ABS to deal with complexity and volatility, and it plays a strategic part in helping adaptive self-governing systems move to become a reality (Tang et al., 2023). Ali Alzahmi has noted the possible difficulties, including the lack of predictability in emerging behaviors, the necessity of thriving, directing, and incorporating with other techniques, blockchain, IoT, and advanced DA, respectively. Ali Alhammadi also mentioned that although ABS helps to create flexibility and innovation, issues of coordination, ethics, and integration of legacy systems must be handled adequately. Mansour Al Hamdani emphasised how critical it is to balance human control with emergent properties, thus ensuring system reliability and innovation (Wu et al., 2022).

To sum up the discussion, ABS has significant advantages in operations and strategy by achieving an intelligent, adaptive, and decentralised system. The stable deployment must attentively consider the following aspects: governance, ethics, integration with other advancing technologies, and human control to provide reliability, resilience, and decision-making when applied to the complex real-world environment.

References:

Ionescu, Ș., Delcea, C., Chiriță, N., & Nica, I. (2024). Exploring the use of artificial intelligence in agent-based modeling applications: A bibliometric study. *Algorithms*, 17(1), 21. Available at: <https://doi.org/10.3390/a17010021> (Accessed: 14 August 2025).

Rich, J., Seshadri, R., Jomeh, A. J., & Clausen, S. R. (2023). Fixed routing or demand-responsive? Agent-based modelling of autonomous first and last mile services in light-rail systems. *Transportation Research Part A: Policy and Practice*, 173, 103676. Available at: <https://doi.org/10.1016/j.tra.2023.103676> (Accessed: 14 August 2025).

Tang, Y., Tao, Y., & Li, Y. (2023). Collection policy analysis for retired electric vehicle batteries through agent-based simulation. *Journal of Cleaner Production*, 382, 135269. Available at: <https://doi.org/10.1016/j.jclepro.2022.135269> (Accessed: 14 August 2025).

Wu, J., Chen, H., Li, Y., & Liu, Y. (2022). A behavioral assessment model for emotional persuasion driven by agent-based decision-making. *Expert Systems with Applications*, 204, 117556. Available at: <https://doi.org/10.1016/j.eswa.2022.117556> (Accessed: 4 August 2025).

Maximum rating: -

Permalink Reply

Summary Post

Summary Post

You are logged in as Fahad Abdallah (Log out)

Policies

Powered by Moodle



