Top 10 Research Papers: Multi-Agent AI Systems and Blockchain Technologies

1. A Blockchain Integration to Support Transactions of Assets in Multi-Agent Systems (2022)

Authors: Fernando G. Papi, Jomi F. Hübner, Maiquel de Brito (Universidade Federal de Santa Catarina, Brazil)

Source: Engineering Applications of Artificial Intelligence, Vol.107 (Jan 2022)

Key Points:

- Proposes an 'artificial institution' on blockchain linking assets and agent interactions.
- Supports decentralized commerce by enforcing service agreements and payments via smart contracts.
- Agents record transactions immutably, ensuring auditability and trust.
- Example: Agent-to-agent service contracts with crypto-based payments.

2. Trust Management for Multi-Agent Systems Using Smart Contracts (2020)

Authors: Kalpesh Lad, M. Ali A. Dewan, Fuhua Lin (Athabasca University, Canada)

Source: IEEE DASC-PICom-CBDCom-CyberSciTech 2020 Conference

Key Points:

- Uses smart contracts for decentralized trust enforcement in MAS.
- Establishes a framework where agent interactions are verified on-chain.
- Ensures credibility and historical tracking of agent behavior.
- Outlines trust logic implementation challenges (e.g., privacy).

3. A Privacy-Preserving and Trustable Multi-Agent Learning Framework (2021)

Authors: Anudit Nagar, Cuong Tran (Bennett University), Ferdinando Fioretto (NYU/UC Davis)

Source: arXiv preprint (June 2021)

Key Points:

- Introduces PT-DL, a decentralized federated learning system with blockchain.
- Smart contract coordinates training and evaluates trust.
- Incorporates differential privacy and penalizes malicious agents.
- Robust even with 50% of agents colluding.

4. Securing Proof-of-Stake Blockchains via Multi-Agent Reinforcement Learning (2024)

Authors: Faisal H. Bappy et al. (Syracuse University and others)

Source: arXiv preprint (July 2024)

Key Points:

- Proposes MRL-PoS+, a consensus model with agents using reinforcement learning.
- Agents detect and isolate malicious behavior.
- Improves resilience over traditional PoS without extra overhead.
- Applies to platforms like Ethereum 2.0.

5. Analysis of Integrating Blockchain Technologies into Multi-Agent Systems (2022)

Authors: Chelsea R. Woodward (Bournemouth University, UK)

Source: arXiv preprint (Dec 2022)

Key Points:

- Survey of blockchain's role in MAS: trust, coordination, and decentralization.
- Recommends platforms like Ethereum for agent interaction.
- Highlights smart contract standardization needs.
- Useful conceptual overview of MAS-Blockchain integration.

6. AI Agents Meet Blockchain: A Survey on Secure and Scalable Collaboration for Multi-Agents (2025)

Authors: Md. Monjurul Karim et al. (SIAT, UST, Innopolis University)

Source: Future Internet 17(2), Feb 2025

Key Points:

- Comprehensive survey of agent-blockchain systems.
- Covers Web3, DeFi, DAO, asset tracking, etc.
- Lists challenges and trends in scalable agent interaction.
- Roadmap for agent-driven, blockchain-secured ecosystems.

7. Secure Consensus Control on Multi-Agent Systems Using PBFT and Raft (2025)

Authors: Jing Zhu et al. (Nanjing Univ. of Aeronautics & Astronautics, CAS)

Source: IEEE/CAA Journal of Automatica Sinica, Vol.12 (Feb 2025)

Key Points:

- Proposes secure MAS consensus using hybrid PBFT and Raft.
- Clusters agents and cryptographically ensures leader logs.
- Outperforms PBFT-only and MSR schemes in simulation.
- Applicable in industrial and robotic MAS.

8. Swarm Contract: A Multi-Sovereign Agent Consensus Mechanism (2024)

Authors: Haowei Yang (HKUST)

Source: arXiv preprint (Dec 2024)

Key Points:

- Defines Swarm Contracts: off-chain agent coordination with multi-sig wallets.
- Each agent is sovereign and operates via consensus.
- Example: NFT auction coordination off-chain with on-chain finalization.
- Reduces gas cost and increases flexibility.

9. Blockchain-Assisted Multi-Expert Demonstration Cloning for Multi-Agent Deep RL (2025)

Authors: Ahmed Alagha et al. (Concordia University, etc.)

Source: arXiv preprint (Jan 2025)

Key Points:

- Agents share expert models using IPFS and blockchain.
- Smart contracts manage access and reward contributors.
- Improves convergence and protects against poisoned models.
- Enhances scalable MARL through verified collaboration.

10. Composable Contracts for Multi-Agent Coordination (2024)

Authors: Christy Chen, Louis Parker (Quantum Eigenspace?)

Source: Agentic Markets Workshop, ICML 2024

Key Points:

- Modular contracts reduce friction in MAS coordination.
- Public visibility and atomic execution prevent misalignment.
- Supports multi-step agreement chaining on-chain.
- Simplifies negotiation among heterogeneous agents.