Sustainable Decentralized Applications in the Age of Agentic AI

The 9th IEEE International Conference on Decentralized Applications and Infrastructures (IEEE DAPPS 2027)

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The 9th IEEE International Conference on Decentralized Applications and Infrastructures (IEEE DAPPS 2027), part of the IEEE CISOSE 2027 Congress, invites researchers, academics, and industry professionals to present advances in decentralized applications (dApps), blockchain, and distributed ledger technologies (DLTs). As decentralized technologies evolve, the Agentic Web—where autonomous AI agents discover, communicate, negotiate, collaborate, and transact—creates both new opportunities and new demands for trusted digital infrastructure. Blockchain and DLTs can support verifiable identity, provenance, reputation, payments, smart-contract execution, and governance for machine-to-machine and human-agent interactions.

A special emphasis of DAPPS 2027 is the convergence of decentralized infrastructures, artificial intelligence, and new forms of economic coordination. We welcome work on markets and institutions in which people, organizations, autonomous agents, and connected devices coordinate resources, exchange value, share knowledge, allocate rewards, and govern common assets. Examples range from programmable markets and decentralized autonomous organizations (DAOs) to agent-mediated contracting, cooperative data and compute economies, public-goods funding, and trusted service ecosystems. Contributions may examine technical designs as well as incentives, market mechanisms, regulation, accountability, and social consequences.

We particularly encourage rigorous research on how these systems can advance, and how they should be evaluated against, the United Nations Sustainable Development Goals (SDGs), including clean energy and climate action, resilient infrastructure, responsible consumption, inclusive economic participation, sustainable cities, and effective institutions. Authors are invited to address measurable outcomes, accessibility, distributional fairness, privacy, safety, environmental footprint, and the limits of blockchain/AI approaches rather than assuming positive impact by design. Work addressing planetary boundaries and long-term community resilience is especially welcome.

IEEE DAPPS 2027 offers an international forum for foundational research, systems engineering, empirical studies, prototypes, field deployments, and interdisciplinary contributions to trustworthy, scalable, secure, and accountable decentralized applications.

Topics of Interest

Topics include, but are not limited to, the following:

Agent-Centric Decentralized Systems



- Autonomous AI agents, LLM-based agents, and multi-agent systems interacting with blockchain and smart contracts
- Agent identity, authorization, verifiable credentials, reputation, and “Know Your Agent” mechanisms
- Agent-to-agent discovery, interoperability, negotiation, cooperation, and communication protocols
- On-chain and off-chain agent payments, wallets, escrow, and programmable economic agency
- Human oversight, delegated authority, explainability, auditability, and liability for agent actions
- Secure agent tool use, verifiable computation, model provenance, and defenses against agentic attacks
- Internet-scale Agentic Web architecture, service composition, and governance

Decentralized Economies, Markets, and Coordination

- New forms of economic coordination among humans, institutions, AI agents, and autonomous devices
- Algorithmic markets, agent-mediated procurement, matching, auctions, bargaining, and resource allocation
- Tokenized and non-token incentives, mechanism design, fair contribution valuation, and revenue sharing
- DAOs, digital cooperatives, collective ownership, voting-power distribution, participation, and accountable governance
- Decentralized data, compute, and AI marketplaces; data-asset valuation, sharing, and federated AI value chains
- Micropayments, machine-to-machine commerce, decentralized finance (DeFi), and cross-border coordination
- Public-goods funding, modular DAOs, community-based infrastructure investment, and resilience financing



Sustainable Development and Public-Interest dApps

- Blockchain and AI-agent systems for SDGs and planetary boundaries: measurable outcomes and impact assessment
- Peer-to-peer renewable energy markets, carbon accounting, energy certificates, and grid flexibility (SDGs 7, 13)

- Inclusive work, fair digital marketplaces, financial inclusion, and responsible data value sharing (SDGs 8, 10)
- Community-based resilience, adaptive infrastructure networks, and sustainable smart cities (SDGs 9, 11)
- Geospatial AI and blockchain for resource governance, supply-chain traceability, and circular economies (SDGs 12, 15)
- Transparent public services, digital public goods, trustworthy institutions, and cross-sector partnerships (SDGs 16, 17)
- Digital health, humanitarian logistics, food systems, and other public-interest deployments (including SDGs 2, 3)
- Life-cycle energy use, inclusion, unintended externalities, and the sustainability trade-offs of decentralized AI

Core dApps, Protocols, and Infrastructure



- DLT architectures, consensus, scaling, transaction ordering, layer-2/off-chain systems, and cross-chain interoperability
- Smart-contract theory, languages, programming models, testing, formal verification, and software engineering
- DePIN (decentralized physical infrastructure networks) and real-world asset (RWA) integration
- Edge/cloud/IoT integration, distributed compute, decentralized storage, and interoperable service protocols
- Performance, cost, availability, fault tolerance, and energy efficiency of decentralized platforms
- Decentralized AI training and inference infrastructure, model sharing, and privacy-preserving analytics

Security, Privacy, Distributed Trust, and Governance



- Security and privacy of dApps, AI agents, wallets, smart contracts, and cross-chain bridges
- Decentralized identity, distributed trust, self-sovereign identity, access control, and credential revocation
- Zero-knowledge proofs, secure multiparty computation, trusted execution, and applied cryptography
- Threat modeling, forensics, economic attacks, adversarial agents, and defense-in-depth
- Governance of agent collectives, protocol incentives, dispute resolution, compliance, and responsible deployment
- Digital sovereignty, legal interoperability, accountability, and protection of users and communities

Emerging Domains and Research Methods

- Applications in mobility, energy, healthcare, climate, science, education, and public administration
- Empirical measurement of decentralized systems, open benchmarks, simulations, reproducibility, and field trials
- Interdisciplinary approaches connecting computer science with economics, policy, law, sustainability, and social science
- Other emerging research at the intersection of autonomous agents and decentralized systems

Contribution Formats

IEEE DAPPS 2027 solicits research papers describing novel and previously unpublished scientific contributions. Three different types of contributions can be submitted:

- **Regular/Full papers** (10 pages, IEEE double-column format)
- **Short papers** (6 pages, IEEE double-column format)
- **Posters** (2 pages, IEEE double-column format)

Important Dates

- **February 1st**: Paper/Poster submission deadline
- **April 15th**: Author notification
- **May 15th**: Final paper submission (camera-ready)
- **June 8th-11th**: Conference dates

Journal Publication Opportunity

Selected full papers accepted and presented at IEEE DAPPS 2027 will be invited to submit extended versions to a Special Issue of the *Journal of Cloud Computing (JCC)* (Springer Nature), subject to further review and the journal's editorial process.

We look forward to welcoming you to IEEE DAPPS 2027! Please visit https://ieee-cisose-congress.org/2027/dapps/ for more detailed information and to submit your contribution. The organizing committee can be reached via email at dapps2027@gmail.com.

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