

PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 1 of 2

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

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Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Additional inventors are being named on the _____ separately numbered sheets attached hereto.		
TITLE OF THE INVENTION (500 characters max):		
Direct all correspondence to: CORRESPONDENCE ADDRESS <input type="checkbox"/> The address corresponding to Customer Number: <div style="border: 1px solid black; width: 250px; height: 25px; display: inline-block; vertical-align: middle;"></div>		
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ENCLOSED APPLICATION PARTS (check all that apply)		
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 2 of 2

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government. (NOTE: Providing this information on a provisional cover sheet, such as this Provisional Application for Patent Cover Sheet (Form PTO/SB/16), does not satisfy the requirement of 35 U.S.C. 202(c)(6), which requires that the *specification* contain a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.)

☐ No.

☐ Yes, the invention was made by an agency of the U.S. Government. The U.S. Government agency name is:

☐ Yes, the invention was made under a contract with an agency of the U.S. Government.

The contract number is: _____

The U.S. Government agency name is: _____

In accordance with 35 U.S.C. 202(c)(6) and 37 CFR 401.14(f)(4), the specifications of any United States patent applications and any patent issuing thereon covering the invention, including the enclosed provisional application, must state the following:

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Provisional Patent Application Draft

Title of Invention: AI Trust Protocols for the Fourth Industrial Revolution

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Filed as a U.S. Provisional Patent Application

Date of Preparation: April 4, 2025

1. Background of the Invention

Artificial Intelligence (AI) systems are becoming increasingly autonomous, performing actions with direct consequences in digital, financial, legal, and physical domains. As we enter the Fourth Industrial Revolution, AI agents are transitioning from passive tools to semi-independent actors. The absence of identity verification and action traceability introduces major accountability risks.

Current identity infrastructure (PKI, user-based authentication) fails to capture the nature of AI decision-making. There is no standardized global protocol for verifying the identity of AI entities or proving the authenticity of their actions. This invention addresses that gap.

2. Summary of the Invention

This invention proposes a framework and system for AI identity and non-repudiation known as the **AI Identity & Non-Repudiation Protocol (AINRP)**. The invention enables:

- Cryptographic identification of AI agents
- Verifiable audit trails of agent actions
- Smart contract-based permissions
- Blockchain-based immutable logging
- Stablecoin integration for traceable, programmable transactions

The protocol ensures that AI agents acting in any domain can be held accountable, and that their actions are linked to verifiable digital identities.

3. Brief Description of the Drawings

A flow diagram of the protocol (can be provided upon request or later submission) includes:

[Agent Action]

- > [DID Authentication]
- > [Smart Contract Validator]
- > [Blockchain Audit Log]
- > [Stablecoin Transaction]

4. Detailed Description of the Invention

AINRP Architecture Includes:

1. **Decentralized Identifiers (DIDs):** Each AI agent is issued a DID linked to:
 - Its developer/operator
 - Its operational domain
 - Its permission scope
 - Cryptographic keys for signing and authentication
2. **Non-Repudiation Ledger:** Every critical action performed by an AI agent is:
 - Digitally signed by the agent
 - Logged on a tamper-evident ledger (e.g., Ethereum, Hyperledger)
 - Time-stamped and linked to the DID
3. **Smart Contract Governance:** Agents interact through smart contracts that define what behaviors and actions are allowed based on their role and scope. Violations trigger logs, alerts, or automated response mechanisms.
4. **Stablecoin Integration:** Where AI agents initiate or approve transactions, programmable stablecoins (e.g., USDC, DAI, GHO) are used to:
 - Execute payments within preset thresholds

- Maintain traceability
- Enforce transaction constraints via smart contracts

5. Integration with AI Work Ecosystems:

- **Human.ai:** Tracks verified task attribution
 - **Render Network (RNDR):** Links identity to compute usage provenance
-

5. Advantages of the Invention

- Enables trusted delegation to AI agents
 - Reduces fraud, spoofing, and liability risks in autonomous systems
 - Provides a legal and technical foundation for future regulation
 - Scales to both digital and real-world applications
-

6. Claims (Provisional Broad Draft)

1. A system for verifying the identity and action traceability of AI agents comprising:
 - Decentralized identifiers
 - Smart contract enforcement mechanisms
 - Blockchain-based audit trail
 - Transaction execution via programmable stablecoins
 2. The method of claim 1 wherein agent actions are signed, validated, and logged via smart contracts.
 3. The method of claim 1 wherein identity and task attribution integrate with decentralized labor and compute marketplaces.
 4. A method of ensuring non-repudiation in AI actions through cryptographic identity binding and immutable logging.
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7. Notes

This draft is intended for use in filing a provisional application with the United States Patent and Trademark Office (USPTO). It may be expanded into a non-provisional utility patent within 12 months.

Prepared by: Logan Alexander Stepp