Tamper-Proof Diagnostic Chain for AI Field Evaluations

# Abstract

A tamper-proof diagnostic verification system for AI-based field service evaluations, designed to ensure data integrity and trustworthiness in photo and video-based plumbing assessments. The system embeds cryptographic timestamps, geolocation metadata, and submission origin tags directly into the diagnostic workflow, creating an immutable audit trail. This ensures clients, inspectors, and contractors can verify when and where a submission was made, by whom, and with what data integrity status. The system includes mechanisms to detect altered or recycled submissions, flag tampering, and restrict retroactive data manipulation without traceability.

# Specification

The invention comprises a digital integrity validation pipeline integrated into AI field diagnostics platforms. The core features include:  
  
1. Embedded Timestamps – Every photo or video submitted is locked with a UTC timestamp at upload.  
2. GPS Anchoring – Devices capture geolocation coordinates and bind them to the media payload.  
3. Submission Source Tagging – Every scan identifies the origin (plumber, client, third-party) using encrypted ID tokens.  
4. Immutable Logging – A hash of each submission is written to a secure, read-only ledger or blockchain-style log.  
5. Tamper Detection – If a submission is re-used, edited, or manipulated, the system flags the discrepancy via digest mismatch.  
6. Dual-Acknowledgment – Optionally, two parties (e.g., plumber and client) confirm scan submission to validate mutual consent.  
7. QR and NFC Check-in (optional) – Real-time check-in at jobsite using device proximity features to confirm physical presence.  
  
Applications include licensing to inspection platforms, municipal verification systems, insurance adjusters, and warranty compliance checks. This invention closes the trust gap between field data and AI interpretation by ensuring the authenticity and integrity of the evidence being analyzed.