Relational Trust Trajectories: Trust as Temporal Relationship

by Nick Clark | Published March 27, 2026 | PDF

Trust between entities is not binary. It grows, decays, recovers, and evolves based on interaction history. Relational trust trajectories model these dynamics as time-series data, tracking the direction, velocity, and acceleration of trust between any two entities. This replaces static trust scores with living relationships that reflect actual interaction patterns.

What It Is

A relational trust trajectory is a time-series representation of the trust relationship between two entities. Rather than assigning a fixed trust score, the system tracks how trust changes over time through successive interactions. The trajectory captures not just the current trust level but its direction of change, rate of change, and historical pattern.

Each interaction between entities contributes an observation to the trajectory. Consistent positive interactions steepen the trust slope. Violations or inconsistencies create discontinuities. Extended periods without interaction produce natural decay.

Why It Matters

Binary trust models cannot distinguish between an entity that has always been marginally trusted and one that was highly trusted but recently experienced a trust violation. Both might have the same current score despite having fundamentally different trust dynamics. The trajectory captures this distinction because the shape of the trust curve carries information that a point-in-time score cannot.

Trajectory-based trust also provides predictive capability. An entity whose trust is steadily declining will likely continue declining, enabling preemptive governance responses.

How It Works

The trajectory is maintained as an append-only sequence of trust observations, each timestamped and attributed to a specific interaction. Trust computation functions evaluate the trajectory using configurable windows, weighting recent observations more heavily than historical ones while retaining the full history for audit.

Derivatives of the trajectory, rate of trust change and acceleration of change, serve as early warning signals. A sudden deceleration in trust accumulation may indicate emerging problems before any trust violation occurs.

What It Enables

Relational trust trajectories enable nuanced governance decisions that account for relationship history. A long-trusted entity experiencing a single anomaly receives different treatment than a newly observed entity with the same behavior. Recovery from trust violations follows observable trajectories, with authorization restored only when the trajectory demonstrates sustained restoration. This mirrors how trust actually functions in human relationships.

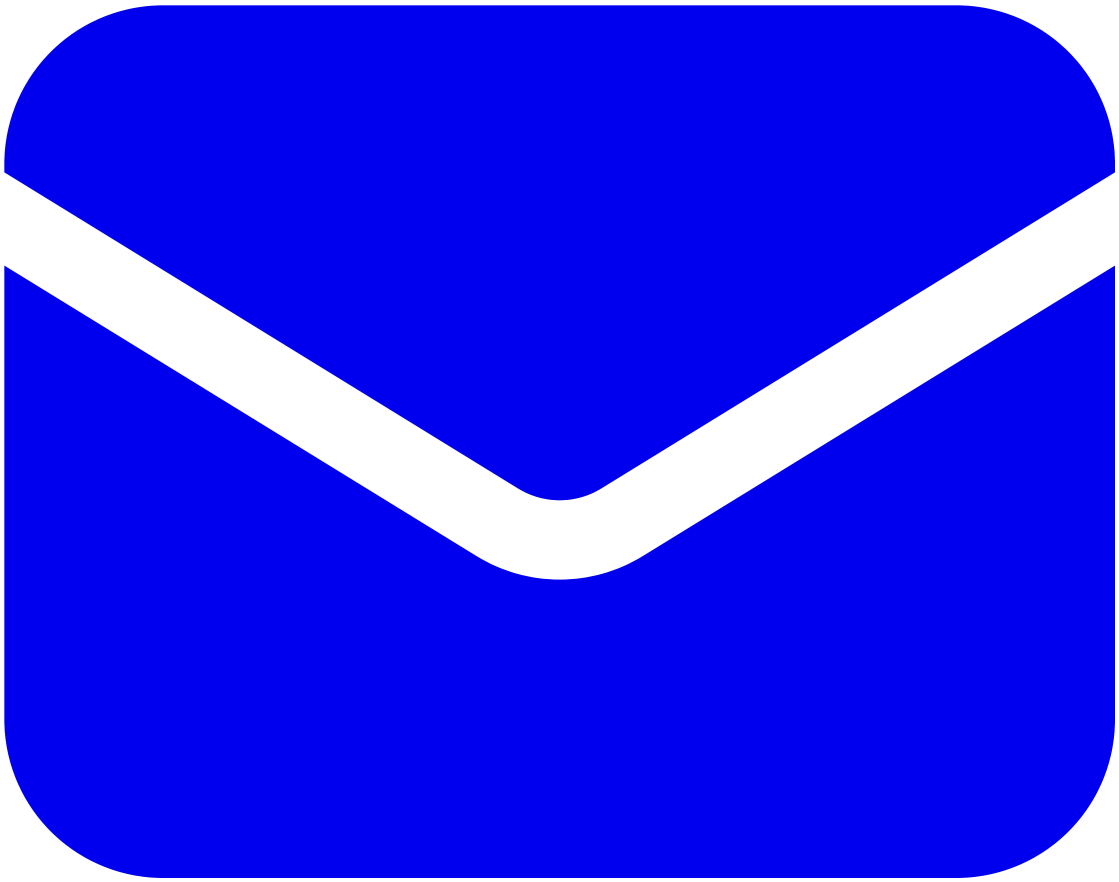
Biological Identity All 21 steps →

Identity from behavioral continuity. No stored templates. No keys.

Primary Technical Disclosure
○ Continuity-Based Biological Identity Using Trust-Slope Validation
Secondary Technical
○ Biological Trust Slope Construction: Identity Through Behavioral Continuity○ Contact, Non-Contact, and Passive Resolution Modes for Biological Identity○ Biological Hash Generation With Domain Separation○ Biological State Inference From Continuity Baseline○ Cross-Modal Biological Hash Fusion○ Biological Continuity as Handoff Verification● Relational Trust Trajectories: Trust as Temporal Relationship○ Identity as Behavioral Continuity: Beyond Single-Point Capture○ Biological-Device-Agent Identity Layering○ Biological Signal Acquisition Tiers○ Noise-Tolerant Feature Normalization for Biological Signals○ Stable Sketching and Helper Data for Biological Features○ Predictive Identity Trajectory: Forecasting Biological Identity Evolution○ Population-Scale Collision Resistance for Biological Hashes○ Adaptive Indexing of Biological Trust Slopes○ Delayed and Sparse Validation for Disconnected Environments○ Policy-Governed Capability Binding for Biological Identity○ Multi-Identity Delegation Without Biological Data Disclosure○ External Credential Integration With Trust-Slope Integrity○ Anti-Spoofing Through Continuity Validation○ Identity Lifecycle Management and Phase-Based Reseeding○ Quorum-Based Biological Identity Recovery○ Privacy Governance and Revocation for Biological Identity○ Human-Agent Primitive Integration for Biological Identity
Applications (General)
○ Airport Security Without Biometric Databases○ Estate Verification Through Behavioral Continuity○ Biological Identity for Elder Care Continuity○ Biological Identity for Child Development Tracking○ Biological Identity for Addiction Recovery Monitoring○ Biological Identity for Workplace Safety Monitoring○ Biological Identity for Athletic Performance○ Biological Identity for Immigration Processing
Applications (Specific)
○ TSA PreCheck Matches Templates, Not Continuity○ Global Entry Verifies Documents, Not Biological Continuity○ Face ID Matches a Stored Model, Not a Living Trajectory○ Samsung Knox Guards the Container, Not the Identity○ ID.me Verifies Documents, Not Biological Continuity○ Socure Scores Risk at a Single Point in Time○ Plaid Identity Verifies Financial Accounts, Not Biological Persons○ Onfido Detects Document Fraud, Not Identity Drift○ Veriff Captures Sessions, Not Trajectories○ Trulioo Queries Databases, Not Biological Trajectories
Biological Identity overview →
AQ
deterministic
autonomy

Legal

Last updated: 2026-03-03



-
- nick@qu3ry.net
- 72 28 14 36 01

Invented by Nick Clark | Founding Investors: Devin Wilkie