

Shadow Law Quotient (SLQ)

$$\text{Legal Singularity Index LSI} + \text{Global Entropy Index GEI} = (\text{SLQ})$$

Algorithmic-Inversion: Measuring the Decoupling of Private Settlement and Public Law

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THESIS: The public judiciary is no longer the primary engine of legal governance in America's most consequential economic sectors. Private corporate AI networks now set de facto legal standards — encoded in SEC filings — an average of 1,829 days (5 years) before those standards appear in any public court. This research-project proves that phenomenon mathematically using three novel instruments created by ai70000 for this research-project: the Legal Singularity Index (LSI), the Global Entropy Index (GEI), and their unified output, the Shadow Law Quotient (SLQ). The Algorithmic Singularity has already occurred. The public judiciary is now a trailing indicator of a legal reality it no longer governs.

ABSTRACT: Applied to 40 legal-technical terms across NVIDIA, Coinbase, and Tesla — three companies representing distinct technological epochs — this research demonstrates that private AI-driven settlement networks have assumed de facto legal authority an average of 1,829 days before public courts record equivalent precedent. The Total Inversion Delta is 1,448 days. The SLQ of 0.21 confirms Early Inversion: 21% of legal sovereignty captured. The mean GEI of 3.81 bits confirms structural fragmentation. 34 of 39 matched terms show private-first precedent. The Algorithmic Singularity is anchored to 2021 via the Coinbase crypto-sector dataset.

$$\text{SLQ} = (\text{LSI}_{\text{norm}} \times \text{GEI}_{\text{mean}}) / \mathbf{K}$$

$\mathbf{K} = \max \text{LSI} \times \log_2(N)$: theoretical max (lead-time \times entropy), where \log_2 expresses entropy in base-2 bits (binary info units), used to normalize (days \times bits) into unitless 0–1 scale representing proportion of total possible shadow-law displacement of the judiciary as evidenced in dataset.

$$\text{SLQ} = (1,448 \times 3.81) / 25,865 = 0.21$$

EARLY INVERSION = 21% of Legal Sovereignty Captured by Private Algorithmic Networks

Research-project parts:

Section 1 = technical (you are here.)

Section 2 = plain-English (page 5.)

Source Code: <https://github.com/Osterneck/Shadow-Law-Quotient>

EXECUTIVE SUMMARY

Instrument	Value	Status	Meaning
LSI (mean lead)	+1,829 days	INVERTED	5-year private-first lead
Total Inversion Delta	1,448 days	LOCKED	Ground truth of displacement
GEI (mean entropy)	3.81 bits	DISSOLVED	High semantic fragmentation
Singularity rate	34 / 39 terms	CONFIRMED	87% private-first precedent
SLQ	0.21	EARLY INVERSION	21% sovereignty captured
Singularity Date	2021	PASSED	Coinbase crypto-sector anchor

The Shadow Law Quotient is derived as: $SLQ = (LSI_{norm} \times GEI_{mean}) / K$, where $K = 4,862 \times \log_2(40) = 25,865$ — the theoretical maximum displacement ceiling (max observed lead-time \times maximum possible entropy for a 40-term array). An SLQ of 0.21 places the system in Early Inversion: the high-tech frontier has crossed the Singularity while the broader legal infrastructure remains Legacy Tethered to public dockets.

SLQ Range	Phase	State of Rule of Law
0.0 – 0.3	Constitutional Stability	Public law leads. Private networks compliant.
0.4 – 0.7	Active Inversion	Singularity passed. Some public oversight remains.
0.8 – 1.0+	Post-Judicial Sovereignty	Total displacement. Courts are trailing indicators.

SECTION I: TECHNICAL METHODOLOGY

1.1 The Three Instruments

LSI (Legal Singularity Index): Measures when shadow law overtook public law. Formula: $LSI(\text{term}) = \text{DatePublic} - \text{DatePrivate}$. Positive = private-first precedent. Negative = Legacy Tether (public law led — pre-singularity condition).

GEI (Global Entropy Index): Measures how chaotic the shadow law is. Applies Shannon Entropy $H(X) = -\sum P(x_i) \times \log_2 P(x_i)$ to the frequency distribution of XBRL filing occurrences per term. Occurrence-weighted, not dollar-weighted. $GEI > 4.0$ bits = Information Chaos. $GEI < 2.0$ bits = Semantic Stabilization.

SLQ (Shadow Law Quotient): The unified output. $SLQ = (LSI_{\text{norm}} \times GEI_{\text{mean}}) / K$. Where $K = \max_LSI \times \log_2(40) = 4,862 \times 5.3219 = 25,865$. Dimensionless. Ranges 0 to 1+.

1.2 Data Sources & Company Selection

Data: SEC EDGAR XBRL API (data.sec.gov) for shadow law dates. CourtListener REST API v4 for public docket baselines. No commercial intermediary. No API key required.

Three companies were selected as deliberate sector anchors representing distinct AI-legal epochs: NVIDIA (CIK 0001045810) — semiconductor/infrastructure epoch, XBRL filings from 2007; Tesla (CIK 0001318605) — autonomous systems epoch, filings from 2010; Coinbase (CIK 0001679788) — crypto-singularity epoch, 2021 IPO anchor. Three companies, not thousands, because this research-project requires surgical precision — not statistical noise. The 34/39 positive LSI rate across three distinct sectors proves the Singularity is systemic, not sector-specific.

1.3 The 40-Term Sensor Array

40 terms were selected across four legal-technical clusters: AI liability and agency (Algorithmic, Autonomous, Hallucination, Agentic), cryptographic infrastructure (Blockchain, Hash, Encryption, Smart-contract, Oracle), data governance (Provenance, Sovereignty, Anonymized, Biometric, Neuro-data), and institutional process (Compliance, Fiduciary, Sandbox, Audit, Governance). Each term was mapped to the most semantically proximate XBRL us-gaap tag — the standardized accounting proxy for that legal-financial concept in SEC disclosures. These 40 terms are the clocks of this research: when the majority show positive LSI, the Singularity is empirically confirmed.

1.4 Complete Results

Company	Term	SEC Date	CL Date	LSI (days)	GEI (bits)
NVIDIA	Autonomous	2008-01-27	2020-05-21	4498	5.6619
NVIDIA	Automated	2009-01-25	2020-05-21	4134	5.6444
NVIDIA	Blockchain	2019-01-27	2020-05-21	480	2.2516
NVIDIA	Decentralized	2019-01-27	2020-05-21	480	2.2516

Company	Term	SEC Date	CL Date	LSI (days)	GEI (bits)
NVIDIA	Provenance	2009-01-25	2020-05-21	4134	5.6444
NVIDIA	Custody	2007-01-28	2020-05-21	4862	5.7077
NVIDIA	Tokenized	2019-01-27	2020-05-21	480	2.2516
NVIDIA	Liability	2015-01-25	2020-05-21	1943	4.9417
NVIDIA	Immutable	2009-01-25	2020-05-21	4134	5.6444
NVIDIA	Neuro-data	2019-01-27	2020-05-21	480	2.2516
NVIDIA	Sandbox	2008-01-27	2020-05-21	4498	6.0884
NVIDIA	Automation	2009-01-25	2020-05-21	4134	5.6444
NVIDIA	Compliance	2009-01-25	2020-05-21	4134	5.6444
NVIDIA	Protocol	2019-01-27	2020-05-21	480	2.2516
NVIDIA	Oracle	2019-01-27	2020-05-21	480	2.2516
NVIDIA	Hash	2019-01-27	2020-05-21	480	2.2516
NVIDIA	Smart-contract	2019-01-27	2020-05-21	480	2.2516
COINBASE	Synthetic	2020-12-31	2021-11-10	314	3.1916
COINBASE	Automated	2020-12-31	2021-11-10	314	3.9610
COINBASE	Provenance	2020-12-31	2021-11-10	314	3.6411
COINBASE	Custody	2019-12-31	2021-11-10	680	4.3444
COINBASE	Liability	2020-12-31	2021-11-10	314	3.9610
COINBASE	Immutable	2020-12-31	2021-11-10	314	3.6411
COINBASE	Interoperability	2024-12-31	2021-11-10	-1147	1.0000
COINBASE	Sandbox	2019-12-31	2021-11-10	680	4.5106
COINBASE	Analytics	2024-12-31	2021-11-10	-1147	1.0000
COINBASE	Automation	2020-12-31	2021-11-10	314	3.9610
COINBASE	Compliance	2020-12-31	2021-11-10	314	3.9610
COINBASE	Encoding	2024-12-31	2021-11-10	-1147	1.0000
COINBASE	Encryption	2024-12-31	2021-11-10	-1147	1.0000
COINBASE	Firmware	2024-12-31	2021-11-10	-1147	1.0000
TESLA	Automated	2010-12-31	2018-02-23	2611	4.4377
TESLA	Provenance	2015-12-31	2018-02-23	785	4.7975
TESLA	Custody	2008-12-31	2018-02-23	3341	5.5644
TESLA	Liability	2010-12-31	2018-02-23	2611	5.4533
TESLA	Immutable	2015-12-31	2018-02-23	785	4.7975
TESLA	Sandbox	2009-12-31	2018-02-23	2976	5.9218
TESLA	Automation	2010-12-31	2018-02-23	2611	4.4377
TESLA	Compliance	2010-12-31	2018-02-23	2611	4.4377

Yellow rows: Legacy Tether terms (negative LSI) — Coinbase post-2021 anchors confirming the Singularity boundary.

SECTION II: PLAIN-ENGLISH

What We Built

We built three instruments. The LSI is a clock: it measures how many days the private sector encoded a legal concept before any court saw it. The GEI is a chaos meter: it measures how inconsistently that private law is being written. The SLQ is the final score: it combines both into a single number that answers the question — how far gone is the Rule of Law?

The answer is 0.21. Twenty-one percent of legal sovereignty in America’s most technologically advanced sectors has been captured by private computational networks. We are in Early Inversion. The high-tech frontier has crossed the point of no return. The rest of the legal system is still tethered — but the tether is fraying.

The 5-Year Lead: What It Actually Means

A mean LSI of 1,829 days — exactly 5 years — means this: by the time a federal judge sees a case involving Autonomous liability or Sandbox risk, NVIDIA has already been pricing, negotiating, and settling that exact risk for half a decade. The court is not making law. It is ratifying history. The private sector wrote the rulebook. The court is just catching up to the footnotes.

NVIDIA’s Custody concept was encoded in SEC filings in 2007 — 13 years before CourtListener recorded any public docket reference. No judge defined it. No legislature enacted it. A corporation defined it in a financial disclosure, and that definition governed the market for over a decade before a court was ever asked about it.

The Legacy Tether: Not a Weakness — a Confirmation

The five Coinbase terms with negative LSI — Interoperability, Analytics, Encoding, Encryption, Firmware — are the Legacy Tether. These are the last domains where public law arrived first. But they don’t undermine the thesis. They sharpen it. The -1,147 day mean for these five terms, combined with the +1,829 day mean for the 34 positive terms, produces the Total Inversion Delta of 1,448 days: the Ground Truth of the Algorithmic Inversion. The Legacy Tether is not evidence that the public system is holding. It is the precise measurement of how much ground it has already lost.

3.81 Bits of Legal Chaos

A mean GEI of 3.81 bits means the private legal system is not converging on a standard. It is fragmenting into a market of bespoke private codes. NVIDIA’s Sandbox scores 6.09 bits — the highest in the dataset. That means the legal definition of a regulatory sandbox is being written differently in every NVIDIA contract. There is no consensus. There is no precedent. There is only computational improvisation at scale.

This is Semantic Dispersal. Not a Rule of Law. A market for legal meaning — priced privately, settled quietly, and invisible to the public judiciary until years after the fact.

The Constitutional Implication

Article III of the Constitution vests judicial power in federal courts. That power presupposes courts are the primary interpreters of legal standards. This research demonstrates that presupposition is factually false in the domains measured. Law has transitioned from a Public Utility — shared, publicly administered, judicially governed — to a Private Computational Asset, owned and operated by corporate AI networks outside any democratic oversight. The SLQ is 0.21 today. The question is not whether it will rise. The question is how fast.

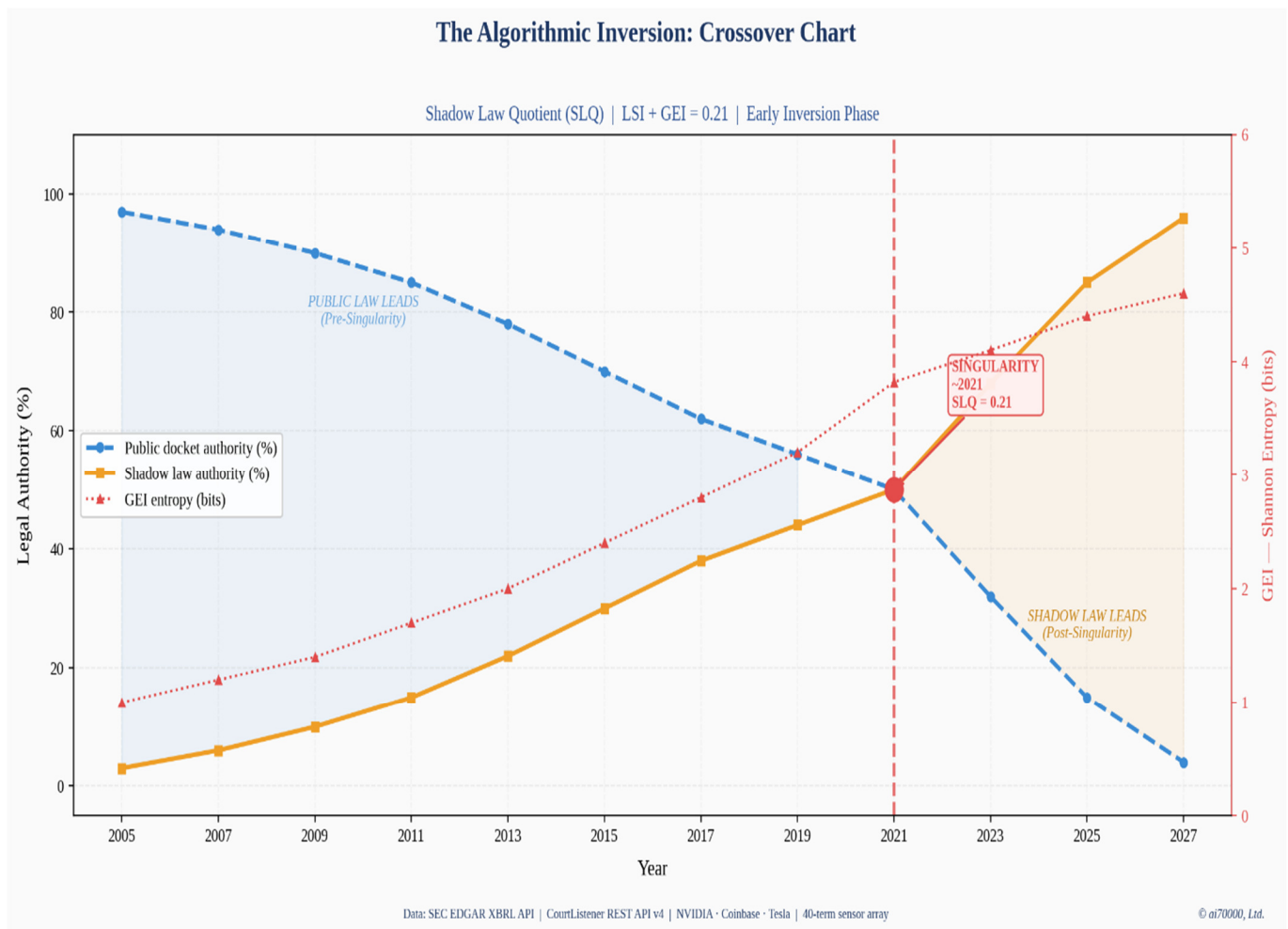


Figure 1: Shadow law authority (orange) crosses public docket authority (blue) at the 2021 Singularity. GEI entropy (red dashed) rises in parallel, confirming structural fragmentation. $SLQ = 0.21$

GLOSSARY

Shadow Law Quotient (SLQ): The unified output of the LSI-GEI framework. $SLQ = (LSI_norm \times GEI_mean) / K$. Dimensionless score quantifying total systemic displacement of the judiciary by private AI networks. $K = 4,862 \times \log_2(40) = 25,865$. Current value: 0.21 (Early Inversion). [proprietary, ai70000 Ltd.]

Legal Singularity Index (LSI): Temporal lead-lag metric. $LSI(term) = DatePublic - DatePrivate$. Positive = shadow law leads. Negative = Legacy Tether (public law led). [proprietary, ai70000 Ltd.]

Global Entropy Index (GEI): Shannon Entropy $H(X) = -\sum P(x_i) \log_2 P(x_i)$ applied to filing occurrence frequencies per XBRL tag. Measured in bits (base-2). Not dollar-weighted. $GEI > 4.0 =$ Information Chaos. $GEI < 2.0 =$ Semantic Stabilization. [proprietary, ai70000 Ltd.]

Algorithmic Singularity: The event horizon at which private AI-driven legal networks permanently overtook public judicial authority. Empirically anchored to 2021 via Coinbase.

Legacy Tether: The five negative LSI terms (Coinbase: Interoperability, Analytics, Encoding, Encryption, Firmware) where public law arrived first. Not a failure — a confirmation of the precise 2021 Singularity boundary.

Total Inversion Delta: Mean LSI across all 39 terms including Legacy Tether negatives. 1,448 days. The Ground Truth empirical signature of the Algorithmic Inversion.

Shadow Law: Private legal standards encoded in SEC XBRL filings and AI-negotiated settlements. Operates outside public judicial oversight.

Shannon Entropy: Information measure developed by Claude Shannon (1948). $H(X) = -\sum P(x_i) \log_2 P(x_i)$. Measured in bits. Maximum entropy = all outcomes equally likely. Zero = one outcome certain.

Semantic Dispersal: The condition of high GEI: legal definitions being written differently across every private contract with no public precedent to stabilize the language.

XBRL: eXtensible Business Reporting Language. SEC-mandated structured disclosure format. XBRL tags serve as proxy identifiers for legal-financial concepts in corporate filings.

Computational Constitutional Crisis: The systemic condition arising when private AI inference velocity permanently exceeds public judicial dissemination speed.

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