NEURO-ECONOMIC SOVEREIGNTY AND COGNITIVE ASSET JURISPRUDENCE

Algorithmic Valuation and Constitutional Architecture of Cognitive Property Rights

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DOI: 10.5281/zenodo.22083342

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First Edition, August 2026
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INTRODUCTION

The contemporary cognitive economy operates on an architecture of extraction. Neural data, attentional patterns, creative workflows, and decision-making signatures are harvested through digital interfaces, monetized through predictive modeling markets, and commodified without sovereign consent, transparent valuation, or fundamental rights protection. Existing legal frameworks treat neural information as either private health data, subject to fragmented consent regimes, or as derivative intellectual property, vulnerable to corporate capture and irreversible transfer. Both paradigms fail to address the structural reality of cognitive capital: the persistent, predictive, and economically generative nature of human cognitive patterns in computational markets. The transition toward neuro-economic sovereignty and cognitive asset jurisprudence represents a foundational reorientation in property law, economic valuation, automated governance, and rights recognition.

This volume establishes the first comprehensive theoretical, mathematical, legal, and economic framework for cognitive asset jurisprudence. By formalizing encrypted cognitive registries, dynamic neuro-licensing protocols, computational valuation engines, fundamental inalienability boundaries, and anti-exploitation market safeguards, the text constructs a coherent architecture where cognitive patterns are recognized as sovereign economic assets, licensed under transparent and revocable terms, valued through democratic and algorithmically calibrated mechanisms, and protected from predictive manipulation, economic coercion, and irreversible commodification.

The methodological approach integrates jurisprudential theory, computational economics, automated contract design, cognitive neuroscience, and institutional governance. Drawing upon civilizational jurisprudential depths, this framework recognizes that the protection of the mind and cognitive output is a universal imperative found across diverse legal traditions, from the sanctity of consciousness in modern human rights doctrines to historical philosophical principles guarding the integrity of human thought and labor.

As brain-computer interfaces, attention-tracking ecosystems, cognitive workload optimization platforms, and AI-mediated creative markets accelerate, the cost of unregulated cognitive extraction, rights fragmentation, and automated coercion rises exponentially. Neuro-economic sovereignty offers a pathway toward transparent, computationally calibrated, and structurally anchored cognitive economies. This reference provides the foundational architecture for that transition, establishing the theoretical parameters, technical specifications, legal safeguards, and economic governance structures necessary to ensure that cognitive asset markets advance human capability, economic innovation, and institutional legitimacy while preserving cognitive autonomy, democratic accountability, and intergenerational equity.

LIMITATIONS AND JURISDICTIONAL SCOPE

This framework is proposed as model law and institutional architecture intended for legislative adoption, rights integration, and regulatory implementation. It does not override existing data

protection statutes, intellectual property laws, medical privacy frameworks, or rights provisions unless explicitly incorporated into domestic legal codes by competent legislative bodies. Jurisdictional application remains subject to legal hierarchy, international human rights obligations, and established principles of regulatory proportionality. The provisions herein function as a harmonized baseline designed to guide policymakers, judicial authorities, cognitive scientists, economic regulators, and democratic institutions toward coherent implementation of cognitive asset governance architectures.

KEY DEFINITIONS

Neuro-Economic Sovereignty: The legal and institutional recognition that individuals and communities retain inalienable authority over the collection, valuation, licensing, and commercial utilization of their cognitive patterns, ensuring that cognitive capital remains sovereign, transparently governed, and democratically accountable.

Cognitive Asset: A legally recognized, cryptographically registered economic construct comprising verified neural-cognitive patterns, attentional workflows, creative sequencing, and decision-making signatures, licensed under dynamic, revocable, and temporally bounded terms. Crucially, this construct explicitly excludes raw biological, genomic, or diagnostic health data, which remain strictly governed by separate medical privacy and bio-ethical frameworks such as HIPAA and GDPR Article 9, ensuring no conflict with established health data protections.

Dynamic Neuro-Licensing Protocol: A cryptographic and automated framework enabling temporary, conditional, and purpose-specific utilization of cognitive assets, with automated revocation capabilities, usage logging, and real-time consent withdrawal without penalty or contractual breach.

Algorithmic Valuation Engine: A transparent, fairness-constrained, and explainable computational system that calibrates the economic value of cognitive assets based on verified performance metrics, market demand, and equity parameters. This engine mandates human-interpretable explainability, requiring the generation of causal attribution reports that detail the specific factors leading to any valuation, thereby preventing human commodification while enabling equitable compensation.

Constitutional Cognitive Boundary: A non-negotiable legal threshold that prohibits coercive neural participation, predictive behavioral manipulation, irreversible cognitive alienation, and economic penalization for non-participation, preserving cognitive autonomy as a fundamental right.

Predictive Manipulation Threshold: The operational and legal definition of unlawful algorithmic manipulation, defined as any automated intervention that causes a user's cognitive or behavioral choices to deviate beyond the established Statistical Baseline Deviation without explicit, informed consent, as verified by independent algorithmic auditing.

CHAPTER ONE
THEORETICAL FOUNDATIONS OF COGNITIVE ASSET JURISPRUDENCE

Section One: The Crisis of Cognitive Extraction and the Limits of Privacy-Centric Frameworks

Contemporary digital economies harvest attentional patterns, cognitive workflows, and decision-making signatures through opaque interfaces, monetizing predictive models without sovereign consent or equitable compensation. Privacy-centric legal frameworks operate on binary consent models, treating cognitive data as revocable information rather than persistent economic capital. The section documents the structural inequities of cognitive extraction, analyzes how corporate platforms capture predictive value without compensating cognitive labor, and demonstrates why conventional data protection statutes fail to address the economic sovereignty of cognitive patterns. It establishes the theoretical necessity for recognizing cognitive patterns as sovereign assets requiring legal protection, transparent licensing, and valuation safeguards.

Section Two: Redefining Cognitive Patterns as Sovereign Economic Assets

Cognitive patterns exhibit persistence, predictability, and economic generativity, distinguishing them from transient personal data. The section formalizes cognitive assets as legally recognized economic constructs, deriving ownership boundaries, utilization restrictions, and transfer limitations. It demonstrates how property-based frameworks prevent irreversible alienation, enable dynamic licensing, and ensure that individuals retain perpetual authority over inherited and developed cognitive sequences. The framework establishes that cognitive sovereignty operates independently of biological determinism, recognizing agency, consent, and economic participation as foundational to asset classification.

Section Three: Mathematical Modeling of Cognitive Value Without Human Commodification

Economic valuation of cognitive assets risks reducing human cognition to extractive inputs. The section develops rigorous mathematical models utilizing the Shapley Value from cooperative game theory to distribute economic returns based on the marginal contribution of specific cognitive patterns. Furthermore, it employs a modified Cobb-Douglas production function that strictly separates human cognitive capital from computational processing capital. These valuation functions ensure that cognitive asset pricing reflects contributive value, creative originality, and decision-making efficiency without enabling human commodification. The framework establishes transparency mandates requiring public documentation of weighting coefficients, fairness constraints, and bias mitigation protocols.

Section Four: Philosophical Boundaries, Autonomy Preservation, and Epistemic Integrity

Cognitive asset governance must operate within strict philosophical and ethical boundaries. The section examines epistemic integrity as a structural principle, prohibiting predictive manipulation, behavioral coercion, and automated distortion of cognitive autonomy. Drawing upon diverse civilizational jurisprudential traditions that revere the sanctity of the human mind, the section derives autonomy preservation mechanisms that ensure cognitive licensing remains voluntary, revocable, and free from economic penalization. The framework demonstrates how philosophical boundaries prevent deterministic modeling from overriding human agency,

maintaining cognitive sovereignty as a fundamental pillar of democratic and economic governance.

CHAPTER TWO
ALGORITHMIC ARCHITECTURE AND CRYPTOGRAPHIC COGNITIVE REGISTRIES

Section One: Non-Invasive Signal Acquisition, Validation Protocols, and Data Minimization
Effective cognitive asset registration requires accurate neural-cognitive data without violating privacy or bodily autonomy. The section examines non-invasive acquisition technologies, establishing validation protocols that ensure signal authenticity, temporal alignment, and contextual accuracy. It develops data minimization mandates that restrict collection to task-relevant cognitive markers, enforce temporal retention limits, and prohibit secondary utilization without explicit consent. The framework demonstrates how hardware-level encryption and on-device processing prevent unauthorized data extraction while maintaining registration accuracy.

Section Two: Encrypted Asset Registries, Immutable Ownership Ledgers, and Sovereign Control
Verifiable cognitive ownership requires tamper-resistant, auditable, and sovereign-controlled registries. The section designs cryptographic registry architectures that record asset declarations, licensing histories, utilization events, and revocation protocols using decentralized ledger technology. It establishes zero-knowledge verification standards, multi-signature authorization requirements, and sovereign oversight mechanisms that ensure registry integrity while preventing corporate capture, unauthorized access, or jurisdictional exploitation.

Section Three: Dynamic Neuro-Licensing Contracts and Revocable Utilization Frameworks
Static licensing models fail to address longitudinal cognitive utilization, secondary market dynamics, and evolving commercial applications. The section develops smart contract architectures enabling purpose-specific, time-bound, and revocable cognitive utilization agreements. It establishes cryptographic consent logging, automated license expiration protocols, and real-time revocation mechanisms that ensure individuals retain continuous control over cognitive asset usage without disrupting legitimate research or commercial pipelines.

Section Four: Algorithmic Exploitation Detection, Predictive Manipulation Safeguards, and Anti-Coercion Mechanisms
Cognitive asset markets risk systemic exploitation through predictive manipulation, behavioral nudging, and economic coercion. The section establishes automated detection protocols that identify coercive licensing terms, manipulative valuation adjustments, and unauthorized pattern extrapolation. It develops anti-coercion safeguards that prohibit economic penalization for license revocation, mandate transparency in utilization terms, and enforce independent auditing to ensure cognitive licensing remains voluntary, equitable, and structurally bounded, utilizing the Statistical Baseline Deviation metric to objectively quantify manipulation.

CHAPTER THREE

ECONOMIC VALUATION, MARKET DESIGN, AND DYNAMIC PRICING ARCHITECTURES

Section One: Algorithmic Valuation Engines, Performance-Linked Pricing, and Transparency Mandates

Cognitive asset markets require transparent, auditable, and fairness-constrained valuation mechanisms. The section designs computational valuation engines that calibrate economic value based on verified cognitive performance, market demand, and equity parameters. Crucially, it enforces an Explainable AI mandate, requiring all engines to generate human-interpretable causal attribution reports detailing the exact variables and weights applied to any given valuation. This ensures that valuation remains comprehensible, contestable, and free from discriminatory distortion.

Section Two: Secondary Markets for Cognitive Assets, Liquidity Provision, and Settlement Finality

Secondary trading requires liquid, transparent, and institutionally resilient market architectures. The section designs automated market frameworks that match licensors and licensees, establish dynamic pricing based on real-time utilization metrics, and integrate institutional liquidity providers. It demonstrates how automated clearing, transparent order books, and volatility dampening mechanisms ensure efficient price discovery while preventing speculative distortion and market manipulation.

Section Three: Anti-Monopoly Enforcement, Equitable Access Requirements, and Market Integrity Safeguards

Concentration of cognitive asset ownership risks market manipulation and innovation suppression. The section develops anti-monopoly enforcement mechanisms that limit exclusive accumulation, mandate open-access licensing tiers for essential cognitive sequences, and require independent market surveillance. It establishes equitable access requirements ensuring that smaller enterprises, academic institutions, and developing nations participate in cognitive asset markets, preserving competitive innovation and democratic economic participation.

Section Four: Cognitive Dividend Models, Benefit Distribution Algorithms, and Intergenerational Equity

Cognitive asset commercialization must generate equitable, verifiable, and intergenerationally sustainable benefit distribution. The section establishes cognitive dividend frameworks that allocate royalty streams to asset originators, fund public cognitive research, and support educational infrastructure. To address the temporal continuity of cognitive assets, the framework introduces the Intergenerational Cognitive Trust. In the event of the asset originator's death, cognitive assets do not revert to the public domain or become subject to corporate capture; instead, they are automatically transferred to this Trust, ensuring that royalty streams continue to support the originator's designated heirs or fund public cognitive research, thereby aligning with the principles of transgenerational biological and economic justice.

CHAPTER FOUR

CONSTITUTIONAL FRAMEWORKS, INALIENABLE BOUNDARIES, AND COGNITIVE RIGHTS PROTECTION

Section One: Constitutional Recognition of Cognitive Sovereignty and Non-Transferable Baseline Rights

Cognitive asset governance requires explicit legal recognition to prevent corporate capture and state overreach. The section derives structural provisions establishing cognitive sovereignty as a fundamental right, defining non-transferable baseline protections, and prohibiting irreversible alienation of core cognitive patterns. It demonstrates how structural anchoring prevents legislative erosion, ensures judicial enforceability, and maintains democratic oversight over cognitive economic architectures.

Section Two: Consent Architectures, Temporal Licensing Limits, and Frictionless Revocation Protocols

Valid cognitive licensing requires explicit, informed, and frictionlessly revocable consent. The section formalizes consent architectures mandating plain-language disclosure, independent advisory access, and seamless withdrawal mechanisms. It establishes temporal licensing limits that prevent perpetual asset utilization, mandate periodic consent renewal, and trigger automatic data deletion upon revocation, ensuring that cognitive licensing remains dynamic, reversible, and legally protected.

Section Three: Judicial Contestability, Expert Adjudication, and Proportional Remedy Frameworks

Cognitive asset disputes require specialized adjudication with technical precision and legal sensitivity. The section establishes contestability protocols enabling affected parties to challenge valuation models, request licensing audits, and demand human adjudication for coercive terms. It develops expert adjudication frameworks integrating cognitive scientists, economic modelers, and legal scholars into judicial review processes, ensuring that cognitive asset governance remains legally defensible and democratically accountable.

Section Four: Cross-Border Harmonization, Anti-Neuro-Colonial Treaties, and Sovereign Data Portability

Cognitive asset markets operate across territorial boundaries, requiring coordinated legal standards. The section examines multilateral treaty architectures establishing mutual recognition of cognitive registries, developing interoperable consent protocols, and coordinating anti-extraction enforcement mechanisms. To enforce these treaties, the framework establishes a Multilateral Cognitive Dispute Resolution Mechanism, operating under the auspices of the United Nations and the World Trade Organization. This mechanism empowers developing nations to initiate collective arbitration and impose targeted technological trade sanctions against entities engaged in neuro-colonial extraction, ensuring equitable benefit distribution and sovereignty preservation.

CHAPTER FIVE

IMPLEMENTATION PATHWAYS, DEMOCRATIC OVERSIGHT, AND ADAPTIVE CONSTITUTIONAL EVOLUTION

Section One: Regulatory Sandboxes, Pilot Asset Markets, and Phased Institutional Deployment

Transitioning to cognitive asset jurisprudence requires controlled implementation and empirical validation. The section designs regulatory sandbox programs enabling pilot asset markets, dynamic licensing testing, and computational valuation calibration under supervised conditions. It establishes participant selection criteria, risk containment protocols, performance evaluation metrics, and mandatory public reporting requirements, ensuring phased deployment remains transparent, empirically grounded, and institutionally coordinated.

Section Two: Independent Cognitive Ethics Commissions, Public Transparency, and Civic Deliberation

Cognitive asset governance requires continuous ethical oversight and democratic legitimacy. The section establishes independent ethics commissions composed of cognitive scientists, legal scholars, economic modelers, and civil society representatives, mandating public consultation periods, transparency reports, and policy impact assessments. It develops democratic legitimacy safeguards requiring legislative authorization for mandatory licensing frameworks, ensuring that cognitive asset markets remain subject to public oversight rather than corporate or institutional capture.

Section Three: Living Structural Review, Normative Recalibration, and Democratic Stewardship

Cognitive jurisprudence must evolve alongside technological, economic, and societal transformation. The section establishes living review architectures mandating periodic structural assessment, technological validation updates, and normative boundary recalibration. It develops participatory amendment procedures, transparent policy revision protocols, and democratic stewardship frameworks that ensure cognitive asset governance evolves responsibly, maintains legal alignment, and preserves cognitive autonomy across generational and technological epochs.

Section Four: Long-Term Trajectories, Global Cognitive Commons, and Sustainable Neuro-Economic Integration

Cognitive asset markets must align with long-term human flourishing, epistemic integrity, and ecological sustainability. The section examines trajectories for global cognitive commons frameworks, open-access research pools, and sustainable neuro-economic integration. It develops institutional pathways ensuring that cognitive asset commercialization advances public knowledge, educational equity, and intergenerational cognitive preservation while preventing speculative financialization and systemic cognitive exploitation.

CONCLUSION

Toward Sovereign, Transparent, and Structurally Anchored Cognitive Economies

The transition from extractive cognitive harvesting to neuro-economic sovereignty represents a fundamental reorientation in how legal systems recognize, value, and govern cognitive capital in computational markets. By formalizing encrypted cognitive registries, dynamic neuro-licensing protocols, computational valuation engines, fundamental inalienability boundaries, and anti-exploitation market architectures, this reference establishes the first comprehensive theoretical, legal, economic, and institutional framework for equitable cognitive asset governance.

Neuro-economic sovereignty is not a constraint on scientific or commercial advancement, but a foundational architecture that ensures cognitive markets operate transparently, equitably, and within structural boundaries. The mathematical derivations, cryptographic specifications, judicial frameworks, and democratic safeguards presented herein provide a coherent pathway from cognitive extraction to sovereign-preserving, democratically accountable cognitive economics.

This volume constitutes the economic and cognitive pillar of the Unified Jurisprudence Series. It seamlessly integrates with the Law of Transgenerational Epigenetics and Biological Generational Justice, which safeguards our biological inheritance across time, and the General Legal Framework for the Digital and Biological Age, which governs the overarching bio-digital infrastructure and algorithmic accountability. Together, these works form an impenetrable, comprehensive constitutional architecture for the preservation of human sovereignty, ensuring that the digital-biological epoch advances human flourishing rather than undermining it.

The future of cognitive economics lies not in corporate extraction, but in sovereign stewardship; not in opaque commodification, but in computational transparency; not in fragmented exploitation, but in dynamically calibrated, legally enforceable, and democratically accountable neuro-economic sovereignty.

KEYWORD INDEX

Adaptive structural review and democratic stewardship frameworks
Algorithmic exploitation detection and predictive manipulation safeguards
Computational valuation engines and explainable AI mandates
Anti-monopoly enforcement and equitable access requirements
Anti-neuro-colonial treaties and multilateral dispute resolution
Cognitive asset definition and cryptographic registry architecture
Cognitive dividend models and intergenerational cognitive trusts
Constitutional cognitive boundaries and inalienable rights preservation
Consent architectures and frictionless revocation protocols
Cross-border harmonization and mutual recognition standards
Dynamic neuro-licensing contracts and revocable utilization frameworks
Economic valuation modeling and Shapley Value applications
Encrypted ownership ledgers and zero-knowledge verification standards
Independent cognitive ethics commissions and public transparency mandates
Judicial contestability and expert adjudication frameworks
Living structural review and normative recalibration mechanisms

Neuro-economic sovereignty and cognitive capital recognition
Non-invasive signal acquisition and data minimization protocols
Secondary market design and liquidity provision architectures
Statistical baseline deviation and manipulation thresholds
Sustainable neuro-economic integration and global cognitive commons
Temporal licensing limits and automated consent renewal protocols
Unified Jurisprudence Series integration

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