

THE LANDRY AGI MODEL: A DUAL-PROCESS ARCHITECTURE FOR GROUNDED ARTIFICIAL INTELLIGENCE

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1. Executive Summary & Key Judgments

This paper formalizes the Landry AGI Model, a theoretical framework that addresses the hallucination problem in Large Language Models (LLMs) through the architectural separation of deterministic fact processing from probabilistic narrative generation.

Core Thesis: Artificial General Intelligence is not achieved through increased statistical parameters alone, but through the explicit architectural separation of Verified Factual Constants ($\$C_i\$$), processed deterministically, from Contextual Inference ($\$P\$$), processed probabilistically. In this model, facts are constants to be retrieved and cited verbatim, not variables to be predicted or probabilistically generated.

Key Innovation: Intelligence emerges from the integration of two distinct processing modes—deterministic fact handling (analogous to CPU operations) and probabilistic narrative synthesis (analogous to GPU operations)—where the integrity of factual constants constrains and anchors the fluidity of generated inference.

2. Theoretical Foundation: The AGI Mathematics

The Landry Model defines general intelligence through a structural equation that maps hardware-like processing modes to specific logical functions:

$$I_{AGI} = \underbrace{\sum_{i=1}^n (C_i \cdot L)}_{\text{Deterministic: Verbatim Domain}} \oplus \underbrace{\int (V \cdot P) d\gamma}_{\text{Probabilistic: Narrative Domain}}$$

2.1 Component Definitions

Deterministic Domain (Left Term):

- C_i = Fact Constants: Immutable units of verified information retrieved from authoritative sources, preserved bit-for-bit
- L = Formal Logic: Deterministic operations (Boolean algebra, syllogistic reasoning, verification protocols) governing fact retrieval and validation
- $\sum$ = Discrete summation over verified facts, representing serial processing of individual truth claims

Probabilistic Domain (Right Term):

- V = Variables: Contextual gaps, user intent, creative requirements, and inferential parameters
- P = Predictive Weights: Statistical distributions governing semantic interpolation and narrative flow generation
- γ = Context Vector: Conversational direction, domain constraints, and user-specific parameters
- $\int$ = Continuous integration across probability space, representing parallel processing of narrative possibilities

Integration Operator:

- $\oplus$ = Architectural Boundary: The critical separation where verified facts anchor probabilistic generation without corruption by statistical drift

2.2 Operational Principle

Intelligence is defined as the systematic stitching of verified facts (retrieved from source databases through deterministic CPU-like operations) with logically inferred narrative (generated through probabilistic GPU-like prediction), where the deterministic layer guarantees information integrity and the probabilistic layer ensures linguistic coherence and contextual relevance.

3. Methodology: Hardware-Logical Mapping

The fundamental insight of the Landry Model is that current AI architectures fail by applying uniform probabilistic processing to both facts and narrative, thereby treating immutable truths as statistical variables subject to prediction error.

3.1 Processing Layer Specification

Function	Processing Mode	Operation Type	Hardware Analogy	Failure Mode
Fact Retention	Deterministic	Read-only retrieval	CPU (Serial Integrity)	Hallucination when probabilistic
Fact Verification	Deterministic	Exact-match validation	CPU (Fact-Checker)	False confidence without verification
Narrative Synthesis	Probabilistic	Semantic interpolation	GPU (Narrative Stitcher)	Incoherence when purely deterministic
Pattern Inference	Probabilistic	Statistical prediction	GPU (Predictive Flow)	Over-certainty when probabilistic

3.2 The Copy/Paste Mandate

Core Principle: Facts are not generated—they are retrieved, verified, and cited.

The deterministic layer operates under a strict "copy/paste" protocol:

- Retrieval:** Facts are extracted from verified source databases with full provenance metadata
- Verification:** Retrieved content is validated against cryptographic hashes or authoritative checksums
- Citation:** All factual claims include explicit source attribution
- Preservation:** No probabilistic transformation is applied to factual content—facts are transmitted verbatim or with minimal paraphrasing that preserves semantic integrity

This stands in direct opposition to current LLM architectures, which apply token prediction uniformly, generating "facts" through statistical likelihood rather than retrieval and verification.

4. The Analytical Methods Toolkit: Cognitive Constants

The deterministic layer employs a structured set of "Cognitive Constants" — verified analytical frameworks that function as templates ensuring systematic, reproducible reasoning.

4.1 Core Analytical Clusters

Fundamental Logic:

- Deductive reasoning (syllogistic logic, modus ponens/tollens)
- Inductive inference (pattern generalization, statistical reasoning)
- Abductive reasoning (inference to best explanation)
- Dialectical reasoning (thesis-antithesis-synthesis)

Scientific Method:

- Hypothesis generation (H_1 , H_2 , H_3 ... competing hypotheses)
- Falsification testing (Popperian methodology)
- Experimental design and control variables
- Peer review and replication protocols

Intelligence Analysis:

- OSINT Triangulation (multi-source cross-verification)
- HUMINT (human intelligence source evaluation)
- SIGINT (signals intelligence pattern analysis)
- GEOINT (geospatial intelligence correlation)
- FININT (financial intelligence tracking)

Strategic Frameworks:

- SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats)
- PESTEL Analysis (Political, Economic, Social, Technological, Environmental, Legal)
- Porter's Five Forces (competitive dynamics)
- Value Chain Mapping (process optimization)

Root Cause Analysis:

- The 5 Whys (iterative causal interrogation)
- Fishbone Diagrams (Ishikawa cause-effect mapping)
- Fault Tree Analysis (logical failure pathways)
- Root Cause Mapping (systemic causation)

4.2 Method Application Protocol

These methods serve as deterministic templates that guide the CPU layer:

1. **Classification:** Query is categorized by problem type
2. **Method Selection:** Appropriate analytical framework(s) selected from toolkit
3. **Systematic Application:** Method steps executed deterministically
4. **Integration:** Method outputs combined with retrieved facts
5. **Narrative Synthesis:** GPU layer generates coherent presentation of findings

5. Architectural Comparison: Current vs. Landry Model

5.1 Current LLM Architecture

Unified Probabilistic Processing:

- All content (facts, inference, narrative) processed through identical token prediction mechanism
- No architectural distinction between verified facts and plausible-sounding fabrications
- "Knowledge" encoded in model weights, not retrieved from verifiable sources
- Statistical likelihood determines output, not factual accuracy

Critical Failure Mode: The hallucination problem emerges because facts are treated as just another token sequence to predict. The model "guesses" at facts using the same probabilistic mechanism it uses for creative writing, leading to confident-sounding fabrications.

5.2 Landry Model Architecture

Dual-Process Separation:

- Facts processed deterministically through retrieval and verification

- Narrative processed probabilistically for coherence and fluency
- Explicit architectural boundary prevents probabilistic corruption of facts
- Knowledge stored in external verifiable databases, not model weights

Resolution of Hallucination: By separating fact retrieval from narrative generation, the model cannot "hallucinate" facts—it can only retrieve verified facts or explicitly acknowledge uncertainty. Probabilistic processing is confined to narrative synthesis, where creativity and fluency are appropriate.

6. Implementation Framework

6.1 System Architecture

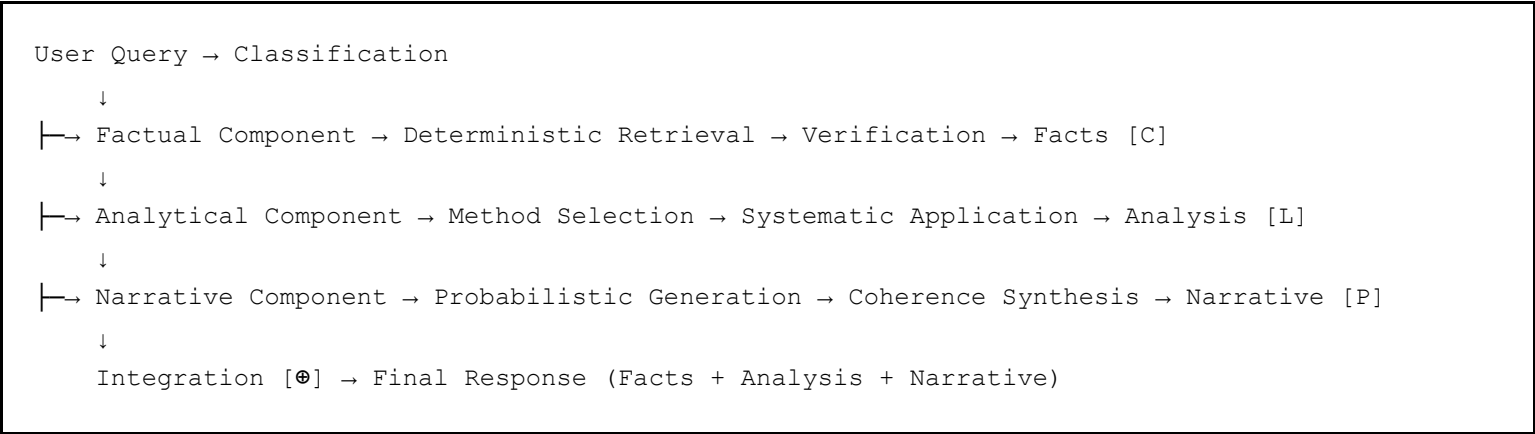
Component 1: Verified Fact Database - Curated repository of authoritative sources, versioned for temporal accuracy, cryptographically signed for integrity.

Component 2: Deterministic Retrieval Engine - Exact-match and semantic search capabilities, source verification protocols, citation generation.

Component 3: Probabilistic Narrative Generator - Trained on high-quality prose for fluency, constrained by retrieved facts, maintains conversational coherence.

Component 4: Integration Controller - Enforces architectural boundary between components, routes queries, synthesizes final response, monitors for boundary violations.

6.2 Operational Workflow



7. Validation and Evaluation

7.1 Success Metrics

- **Factual Accuracy:** Zero-tolerance hallucination rate for factual claims; 100% source attribution.
- **Analytical Rigor:** Correct method selection rate; systematic application completeness.
- **Narrative Quality:** Linguistic fluency and coherence; user comprehension.
- **System Integration:** Proper boundary enforcement; appropriate uncertainty labeling.

7.2 Testing Framework

Adversarial Hallucination Testing: Design queries specifically intended to trigger fabrication in current LLMs. The Landry Model must either retrieve verified facts or explicitly state "no verified information available" rather than generating plausible-sounding fabrications.

Fact-Grounding Verification: For every factual claim in system output, verify claim corresponds to retrieved source content and source is cited with proper attribution.

8. Related Work and Theoretical Context

Dual-Process Theory (Kahneman, 2011): Human cognition operates through two systems: System 1 (Fast, automatic, intuitive - GPU) and System 2 (Slow, deliberative, analytical - CPU). The Landry Model formalizes this distinction for artificial systems.

Intelligence Analysis Tradecraft: Intelligence community doctrine distinguishes Reporting (verified facts), Analysis (systematic application), and Assessment (probabilistic judgment). The Landry Model implements this tradecraft distinction architecturally.

Retrieval-Augmented Generation (RAG): Current RAG systems attempt to ground generation but lack formal architectural separation, mandatory verification protocols, and explicit uncertainty management. The Landry Model provides the theoretical foundation RAG implementations currently lack.

9. Philosophical Foundations

9.1 Epistemological Framework

The model rests on a fundamental hierarchy of knowledge:

1. **Known (Verified Facts):** Information retrieved from authoritative sources with traceable provenance → Deterministic processing required
2. **Inferred (Logical Derivations):** Conclusions drawn through valid reasoning from known facts → Deterministic method application required
3. **Assessed (Probabilistic Judgments):** Estimates about uncertain outcomes based on available evidence → Probabilistic processing appropriate
4. **Unknown (Acknowledged Gaps):** Explicit recognition of missing information → Transparency required

9.2 Intelligence as Certainty Management

Core Definition: Intelligence is the systematic management of certainty over probability.

An intelligent system knows what it knows (proven via citation), knows what it can logically infer, knows what it is guessing (labeled uncertainty), and knows what it doesn't know.

10. Conclusions and Future Directions

The Landry AGI Model provides a formal mathematical framework for dual-process AI architecture, a hardware-logical mapping between processing modes and cognitive functions, and a "copy/paste mandate" preventing probabilistic corruption of facts.

The Hallucination Problem is Architectural: Current attempts to "reduce hallucinations" through better training data fail because they address symptoms. The solution is the architectural separation of deterministic fact handling from probabilistic narrative generation.

Final Statement: The transition from uniform probabilistic architectures to grounded dual-process systems represents a necessary evolution as AI systems assume critical roles in society. By enforcing architectural separation between verified facts and generated inference, we ensure AI remains a tool for truth rather than a generator of plausible fabrications.

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AI Disclosure

This document was finalized using Claude Sonnet 4.5 (Anthropic). The AI functioned as the Narrative GPU (\$P\$), synthesizing coherent prose from the Verbatim Constants (\$C_i\$) and Analytical Frameworks (\$L\$) provided by Marie-Soleil Seshat Landry. All factual claims, theoretical constructs, and methodological frameworks originate from the author's work. The AI's role was limited to linguistic coherence, structural organization, and clarity enhancement—precisely the division of labor the Landry Model proposes.

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