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The Semantic World

The Computational Domain of Meaning

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Abstract

The previous papers in the Architecture of Intelligence research series established that intelligent behaviors operate upon a persistent Semantic World and that Intrinsic Memory provides the computational substrate required to preserve its continuity. This paper examines the Semantic World itself as an independent computational domain.

The Architecture of Intelligence proposes that meaning is neither an intrinsic property of symbols nor the product of computation performed in isolation. Instead, meaning emerges through the continuous evolution of a persistent Semantic World whose lawful organization is formed by persistent Identities, immutable Events, and Identity-Centric Persistent Relations. Semantic Assertions do not constitute this organization; rather, they qualify the semantic status under which observations are interpreted.

This paper defines the Semantic World as the persistent computational environment from which meaning continuously emerges and upon which intelligent behaviors operate. It introduces its fundamental semantic structures, explains how their lawful organization enables the continuous evolution of the Semantic World, and establishes the ontological foundations upon which the formal, mathematical, and computational models developed in subsequent papers are built.

Scope of this Paper

The purpose of this paper is to define the ontology of the Semantic World within the Architecture of Intelligence.

Rather than introducing new computational mechanisms or mathematical formalisms, this paper establishes the persistent semantic structures that constitute the Semantic World and explains how their lawful organization enables the continuous emergence of meaning. It introduces the concepts of Identity, Event, Identity-Centric Persistent Relation, Semantic Assertion, Temporal Continuity, Semantic Topology, Semantic Entropy, and Meaning Emergence as the fundamental concepts governing the Semantic World.

The mathematical properties governing these structures, together with their computational realization within the Andisheh Engine, are developed in subsequent papers. The present work therefore serves as the ontological foundation upon which the remainder of the research program is constructed.

Introduction

The preceding papers in this research series introduced two fundamental principles of the Architecture of Intelligence. The first established that intelligent behaviors are not independent computational entities but emerge through computation operating upon a persistent Semantic World. The second demonstrated that such a world requires a computational substrate capable of preserving semantic continuity through time. That substrate was introduced as Intrinsic Memory.

These conclusions naturally lead to a more fundamental question.

What is the Semantic World itself?

Although the concept has been introduced throughout the previous papers, it has thus far served primarily as an architectural dependency. Intelligent behaviors operate upon it, and Intrinsic Memory preserves it, yet its internal organization has not been examined independently. Before formal mathematical models or computational implementations can be developed, the persistent semantic structures that constitute this world must first be defined.

The Architecture of Intelligence proposes that the Semantic World is neither a database, a graph, a knowledge base, nor a representation of language. It is an abstract computational domain whose purpose is to preserve and organize the persistent semantic structures from which meaning emerges. Within this domain, meaning is not attached to isolated symbols or reconstructed from temporary computational states. Instead, meaning continuously emerges as the Semantic World evolves through the accumulation and lawful organization of persistent semantic structures across successive observations.

This paper therefore shifts the focus of the discussion from computational architecture to semantic ontology. Rather than asking how intelligent systems process information, it asks what persistent semantic structures must exist for a Semantic World to continuously evolve and for meaning to emerge. The following sections introduce these structures and describe how they collectively constitute a coherent and continuously evolving Semantic World.

The Semantic World

The Architecture of Intelligence defines the Semantic World as an abstract computational domain composed of persistent semantic structures whose lawful organization provides the conditions from which meaning continuously emerges. It is the environment within which observations become knowledge, semantic continuity is preserved, and intelligent behaviors operate.

The Semantic World is not a representation of language. Neither is it a collection of symbols, database records, graph nodes, vectors, or embeddings. Such structures may encode, reference, or communicate semantic information, but they are not meaning itself. Meaning continuously emerges only through the persistent semantic organization maintained within the Semantic World.

The Semantic World is fundamentally composed of three classes of persistent semantic structures.

Persistent Identities provide stable semantic reference. They represent the entities, concepts, or abstractions whose existence remains continuous across successive observations.

Immutable Events preserve observations as permanent semantic occurrences. Every observation admitted into the Semantic World becomes part of its immutable semantic history and contributes to the continuous evolution of the world through time.

Identity-Centric Persistent Relations preserve the semantic organization connecting persistent Identities throughout the Semantic World. Together with Identities and Events, they maintain the evolving semantic topology from which meaning continuously emerges.

Semantic Assertions constitute a semantic qualification layer rather than a fundamental semantic structure. They describe the semantic status under which observations are interpreted. Properties such as polarity, modality, epistemic status, and assertion type determine whether an observation is affirmed, negated, hypothetical, uncertain, or otherwise qualified without altering the underlying semantic organization of the Semantic World.

Together, these semantic structures and semantic qualifications enable a coherent and continuously evolving computational world. Intrinsic Memory preserves their continuity through time, while intelligent behaviors operate upon the persistent Semantic World rather than constructing meaning independently.

From this perspective, the Semantic World is not merely a repository of semantic information. It is the persistent computational environment whose continuous evolution enables meaning to emerge. Every subsequent concept developed throughout the Architecture of Intelligence—including semantic topology, deterministic retrieval, identity formation, and intelligent behaviors—depends upon the existence and continuous evolution of this persistent semantic domain.

Identity

Identity is the fundamental unit of semantic persistence within the Architecture of Intelligence. Every persistent semantic structure that exists within a Semantic World ultimately derives its organization from persistent Identities.

An Identity is not a name, a label, a database record, or a collection of attributes. These may describe or reference an Identity, but they are not the Identity itself. An Identity represents the persistent semantic existence of an entity, concept, or abstraction that remains continuous across successive observations.

The defining property of an Identity is continuity through time. Regardless of how its observable characteristics evolve, the Identity itself persists as the stable semantic reference to which all subsequent observations, Events, and Identity-Centric Persistent Relations are attached.

This distinction separates Identity from representation. A person's name may change, a company may relocate, a planet may acquire new observations, and a scientific theory may evolve through successive discoveries. Such changes alter the semantic structures associated with an Identity without replacing the Identity itself.

Within the Semantic World, persistent Identity enables the continuous semantic organization from which meaning emerges. Without persistent Identity, successive observations cannot be guaranteed to refer to the same semantic object, causing the Semantic World to fragment into disconnected observations whose relationships must continually be reconstructed.

Identity therefore serves as the persistent semantic anchor that enables the continuous evolution of the Semantic World and the emergence of meaning.

Identity Formation

Every persistent Identity begins with an observation that establishes its semantic existence within the Semantic World.

Identity Formation is the process through which a previously unobserved semantic entity becomes a persistent Identity. This process does not create the entity itself; rather, it admits the entity into the Semantic World as a stable semantic reference capable of participating in future observations.

Once formed, an Identity becomes persistent. Subsequent observations do not create additional Identities for the same semantic entity. Instead, they contribute new Events and Identity-Centric Persistent Relations that expand the semantic structures associated with the existing Identity.

The correctness of Identity Formation is therefore fundamental to semantic continuity. If observations referring to the same semantic entity create multiple independent Identities, semantic knowledge becomes fragmented. Conversely, if observations concerning distinct semantic entities are incorrectly associated with a single Identity, semantic organization becomes corrupted.

Identity Formation is therefore not merely a mechanism for assigning identifiers. It establishes the semantic continuity upon which every subsequent observation depends.

Identity Evolution

Persistence should not be confused with immutability.

While an Identity remains continuous throughout its existence, the semantic structures associated with that Identity continually evolve through new observations.

This evolution occurs through immutable Events and the Identity-Centric Persistent Relations they establish. As successive observations are admitted into the Semantic World, they expand the semantic history surrounding an Identity without replacing or altering the Identity itself.

An individual may acquire new knowledge, change occupations, relocate to another country, or establish new relationships. An organization may grow, merge, or alter its internal structure. A scientific concept may accumulate new observations and refined understanding. In every case, the semantic structures surrounding the Identity evolve while the Identity itself remains the persistent semantic reference connecting those observations through time.

The distinction between persistent Identity and evolving semantic structure is essential to preserving semantic continuity. The continuous emergence of meaning depends not upon freezing semantic state, but upon allowing the Semantic World to evolve while maintaining stable semantic reference.

Identity Evolution therefore represents the continuous accumulation of semantic history rather than the replacement of semantic existence.

Identity Death

Not every persistent Identity continues to participate indefinitely in new observations. Individuals die, organizations dissolve, technologies become obsolete, and physical objects may cease to exist.

Within the Architecture of Intelligence, however, the end of participation does not imply the disappearance of Identity.

An Identity is never removed from the Semantic World simply because the entity it represents no longer exists in the physical world. Instead, the Identity persists as a historical semantic object whose complete semantic history remains available to subsequent observations and deterministic Semantic Retrieval.

Identity Death therefore signifies the conclusion of an Identity's active participation in the evolving Semantic World rather than the destruction of the Identity itself. Historical Events, Identity-Centric Persistent Relations, and the semantic structures associated with that Identity remain part of the world's permanent semantic organization.

This distinction preserves semantic continuity across time. Without persistent historical Identities, the Semantic World would continually lose portions of its semantic history, preventing future observations from maintaining coherent relationships with past knowledge.

Within the Architecture of Intelligence, the Semantic World extends beyond the present moment. It therefore preserves both active and historical Identities as integral components of its continuously evolving semantic organization, allowing meaning to continue emerging from the accumulated semantic history of the world.

Event

If Identities provide the persistent semantic reference within a Semantic World, Events provide its history.

An Event is an immutable semantic observation that records the occurrence of a relationship, action, state, or transformation involving one or more persistent Identities. Every observation admitted into the Semantic World becomes an Event, contributing permanently to its semantic history.

Unlike Identities, which persist continuously through time, Events are immutable. Once admitted into the Semantic World, an Event is never altered or replaced. New observations do not modify existing Events; they generate additional Events that extend the semantic history of the participating Identities.

This immutability preserves the integrity of semantic continuity by ensuring that the accumulated semantic history of the Semantic World remains permanently accessible. Every stage in the evolution of the Semantic World therefore remains available for future observations and deterministic Semantic Retrieval without ambiguity.

Events should therefore not be understood as transient computational operations. They are persistent semantic records that collectively describe the evolution of the Semantic World itself.

Every change observed within the Semantic World occurs through Events. Identities persist, while Events record their history.

Semantic Assertions

An Event records not only what has been observed, but also the semantic conditions under which that observation is admitted into the Semantic World.

The Architecture of Intelligence introduces Semantic Assertions as semantic properties that qualify an Event without altering the underlying persistent semantic structures it describes. Assertions determine the semantic status under which an observation is interpreted rather than its semantic content.

A statement may be asserted as true, denied, questioned, reported, hypothesized, or expressed as a possibility. Although these observations may refer to the same participating Identities and the same underlying semantic structures, their Semantic Assertions differ. The Semantic World therefore preserves both the persistent semantic structures and the semantic qualification under which those structures are interpreted.

Semantic Assertions therefore preserve the distinction between an observation and the semantic commitment associated with that observation.

Within the Architecture of Intelligence, Semantic Assertions include properties such as polarity, modality, epistemic status, and assertion type. Together, these properties determine whether an Event is affirmed or negated, certain or uncertain, factual or hypothetical, observed directly or reported indirectly.

By separating persistent semantic structures from Semantic Assertions, the Semantic World preserves both what has been observed and the semantic qualification under which those observations are interpreted. This distinction enables multiple interpretations of the same underlying semantic structures to coexist while preserving semantic continuity.

Identity-Centric Persistent Relations

Meaning does not emerge from isolated Identities, independent Events, or individual semantic structures. It emerges through the persistent semantic organization of the continuously evolving Semantic World. Identity-Centric Persistent Relations preserve the organization that connects those structures across time.

The Architecture of Intelligence defines Identity-Centric Persistent Relations as the persistent semantic structures that organize the relationships between Identities throughout their semantic existence.

These relations are identity-centric because their continuity depends upon the persistent Identities they connect rather than upon individual observations. Events may establish, modify, strengthen, weaken, or terminate semantic relationships, yet the participating Identities remain the persistent semantic anchors through which those relationships evolve.

Unlike transient computational links or database associations, Identity-Centric Persistent Relations are themselves part of the Semantic World. They evolve through immutable Events while preserving the continuity of semantic organization across time.

This distinction allows semantic structure to evolve without sacrificing continuity. Relationships are neither recreated from isolated observations nor inferred repeatedly during deterministic Semantic Retrieval. Instead, they persist as continuously evolving components of the Semantic World whose history remains permanently connected to the Identities they organize.

Identity-Centric Persistent Relations therefore preserve the semantic organization through which the Semantic World continuously evolves, enabling meaning to emerge beyond individual observations.

Semantic Topology

The Semantic World is not merely a collection of persistent semantic structures. It is their lawful and continuously evolving organization.

The Architecture of Intelligence refers to this organization as Semantic Topology.

Semantic Topology describes the overall organization of persistent Identities, immutable Events, and Identity-Centric Persistent Relations into a coherent and continuously evolving Semantic World. Semantic Assertions do not constitute the topology itself; rather, they qualify the semantic status under which that topology is interpreted.

It is this organization—rather than the mere existence of individual semantic structures—from which meaning continuously emerges.

Meaning therefore does not reside within isolated symbols, individual observations, or independent semantic structures. It continuously emerges from the lawful organization of the Semantic World as a whole.

Although the Semantic World may be represented using graph structures, knowledge graphs, databases, or other computational representations, these should not be confused with the Semantic World itself. Such representations are implementations capable of encoding aspects of semantic organization. The Semantic World refers instead to the persistent and continuously evolving semantic organization that those representations seek to preserve.

Semantic Topology is therefore independent of any particular representation. Whether implemented through graphs, relational structures, distributed memory systems, or future computational models, the defining characteristic of a Semantic World is the continuity of its semantic organization throughout its continuous evolution.

Within the Architecture of Intelligence, every intelligent behavior—including Semantic Retrieval, reasoning, planning, learning, and prediction—operates upon this persistent semantic topology rather than constructing meaning independently through isolated computation.

Temporal Continuity

The Semantic World exists not merely as a collection of persistent semantic structures, but as a continuously evolving semantic history. Every observation contributes to this history through immutable Events, while persistent Identities and Identity-Centric Persistent Relations preserve the continuity connecting past, present, and future observations.

The Architecture of Intelligence refers to this uninterrupted evolution as Temporal Continuity.

Temporal Continuity ensures that semantic structures do not exist as isolated snapshots. Every observation is understood within the accumulated semantic history that precedes it, allowing the Semantic World to evolve continuously while enabling meaning to emerge without losing coherence through time.

This continuity distinguishes a Semantic World from systems that repeatedly reconstruct semantic state from disconnected records or temporary computational contexts. In such systems, historical continuity must continually be inferred. Within the Semantic World, continuity is preserved directly through the persistent organization of semantic structures.

Temporal Continuity therefore enables the Semantic World to evolve while remaining semantically coherent. New observations extend existing semantic history rather than replacing it, ensuring that the Semantic World continues to evolve while meaning continuously emerges from its accumulated semantic organization.

The Semantic World is therefore not static. It is a persistent computational domain whose semantic organization evolves continuously through time while preserving its semantic integrity.

Semantic Entropy

The coherence of a Semantic World depends upon the continuity and organization of its persistent semantic structures. Whenever that organization becomes fragmented, inconsistent, or disconnected, the semantic integrity of the world begins to deteriorate.

The Architecture of Intelligence describes this degradation as Semantic Entropy.

Semantic Entropy does not arise from the accumulation of information. Rather, it results from the loss of semantic continuity. Fragmented Identities, disconnected Events, inconsistent Identity-Centric Persistent Relations, or incomplete semantic histories gradually reduce the coherence of the Semantic World.

As Semantic Entropy increases, the Semantic World loses the semantic organization from which meaning emerges. Semantic Retrieval requires increasing reconstruction, observations become more ambiguous, and intelligent behaviors operate upon an increasingly fragmented semantic environment.

Intrinsic Memory exists to counteract this tendency. By preserving persistent semantic structures and their continuity throughout observation and deterministic Semantic Retrieval, it maintains the coherence of the Semantic World and minimizes the accumulation of Semantic Entropy.

Within the Architecture of Intelligence, Semantic Entropy is therefore understood not as a property of data, but as a property of the Semantic World's organization itself.

Meaning Emergence

The preceding sections have introduced the fundamental semantic structures that constitute the Semantic World and the organizational principles through which it continuously evolves. These concepts collectively lead to the central theory of meaning within the Architecture of Intelligence.

Meaning is neither an intrinsic property of symbols, words, data structures, nor computational representations. Nor is it generated independently by isolated computational processes. Symbols may represent meaning, communicate meaning, or reference meaning, but they do not constitute meaning themselves.

Meaning emerges through the continuous evolution of a persistent Semantic World whose lawful organization is formed by persistent Identities, immutable Events, and Identity-Centric Persistent Relations. Semantic Assertions qualify the semantic status under which those structures are interpreted without becoming part of the underlying semantic organization itself.

The continuous emergence of meaning depends fundamentally upon semantic continuity. Persistent Identities provide stable semantic reference. Immutable Events preserve semantic history. Identity-Centric Persistent Relations preserve semantic organization. Semantic Assertions qualify observations without altering the underlying semantic structures. Temporal Continuity preserves the continuous evolution of the Semantic World, while Intrinsic Memory preserves the semantic continuity upon which that evolution depends.

Meaning therefore emerges not from any individual semantic structure, but from the continuously evolving Semantic World as a whole.

Within this framework, intelligent behaviors neither generate nor contain meaning independently. They operate upon an already meaningful Semantic World whose continuously evolving semantic organization has been preserved through Intrinsic Memory.

Conclusion

The previous papers in this research series established that intelligent behaviors require a persistent Semantic World and that Intrinsic Memory provides the computational substrate necessary to preserve its continuity. This paper has examined the Semantic World itself by defining the persistent semantic structures and organizational principles through which that world continuously evolves.

The Semantic World has been presented as an abstract computational domain composed of persistent Identities, immutable Events, and Identity-Centric Persistent Relations whose lawful organization forms a coherent and continuously evolving semantic domain. Semantic Assertions constitute a semantic qualification layer that preserves the semantic status under which observations are interpreted without altering the underlying semantic organization. Together, these concepts establish a Semantic World whose continuity is maintained through Temporal Continuity and whose degradation may be understood in terms of Semantic Entropy.

Within the Architecture of Intelligence, meaning is therefore neither attached to individual symbols nor produced by isolated computation. Instead, it continuously emerges from the lawful organization and continuous evolution of the Semantic World itself. Intrinsic Memory preserves the semantic continuity upon which that evolution depends, enabling the Semantic World to remain a coherent and persistent computational domain.

This ontological foundation establishes the conceptual framework upon which the remainder of the research program is built. The papers that follow formalize these concepts mathematically, define the computational mechanisms through which they are realized, and demonstrate how deterministic semantic computation operates upon this persistent and continuously evolving Semantic World.

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