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# Architecture of Intelligence

## Intrinsic Memory as the Foundation of Intelligent Behavior

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**VERSION**
1.0
**PUBLISHED**
July 2026

## Abstract

Artificial intelligence has traditionally been approached through learning algorithms, reasoning systems, optimization techniques, and statistical models. While these approaches have advanced the capabilities of computational systems, they primarily focus on improving how machines perform intelligent tasks rather than examining the computational environment required for such behaviors to exist.

This paper proposes a different architectural perspective. Rather than defining intelligence itself, it investigates the computational substrate upon which intelligent behaviors become possible.

The central proposition is that intelligent behaviors operate upon an abstract computational domain called the Semantic World. The Semantic World is a persistent and continuously evolving computational domain whose organization is formed by persistent Identities, immutable Events, and Identity-Centric Persistent Relations. Such a world cannot emerge from conventional storage systems alone. Instead, it requires a new class of computational infrastructure called Intrinsic Memory, whose responsibility is to preserve semantic continuity as a first-class computational property.

This paper introduces the conceptual foundations of this architecture and establishes the dependency: Intrinsic Memory → Semantic World → Intelligent Behaviors.

This principle forms the basis for a new class of computational systems referred to as Intrinsic Memory Engines.

## Scope of this Paper

This paper introduces the conceptual foundations of the Architecture of Intelligence.

Its objective is not to propose a learning algorithm, neural architecture, reasoning engine, or statistical model. Instead, it defines the computational substrate required before intelligent behaviors can emerge.

Accordingly, this paper focuses on the conceptual architecture rather than its formalization or implementation. Mathematical foundations, semantic ontology, computational models, and system architecture are developed separately throughout the Cosinia Research Series.

## Introduction

Most computational theories begin by asking how intelligence can be achieved.

This work begins by asking a different question: What must exist before intelligent behavior becomes computationally possible?

The distinction is fundamental. Rather than treating intelligence as an isolated capability, this work proposes that intelligent behaviors require a persistent computational environment upon which they operate.

Consequently, this paper does not attempt to redefine intelligence itself. Instead, it introduces the computational architecture required for intelligent behaviors to emerge.

## Intelligence and Intelligent Behaviors

Traditional approaches frequently describe intelligence as an independent capability possessed by an agent or computational system.

The Architecture of Intelligence adopts a different perspective.

This work intentionally avoids defining intelligence as an independent computational entity. Instead, intelligence is viewed as the collective manifestation of multiple computational behaviors operating upon a persistent and continuously evolving Semantic World.

Examples of Intelligent Behaviors include:

- Learning
- Reasoning
- Planning
- Prediction
- Recall
- Decision Making

Although these behaviors differ in purpose and implementation, they all share one common prerequisite: they operate upon a persistent and continuously evolving Semantic World.

> ***Intelligence is not an independent computational entity. Intelligence is the collective designation given to a family of computational behaviors operating upon a persistent and continuously evolving Semantic World.***

# Core Terminology

> *Meaning is the emergent semantic phenomenon arising from the continuous evolution of a persistent Semantic World. Individual observations do not possess meaning in isolation; they derive meaning from their integration into the accumulated semantic organization of the Semantic World.*

> *An Identity is a persistent semantic object that maintains continuity across time. Although its state may evolve through Events, the Identity itself remains continuous.*

> *An Event is an immutable semantic observation describing an occurrence involving one or more Identities. Events record what has occurred and collectively preserve the history of the Semantic World.*

> *An Identity-Centric Persistent Relation is a persistent semantic structure that organizes the relationships between Identities across time. Together with persistent Identities and immutable Events, Identity-Centric Persistent Relations preserve the evolving semantic organization of the Semantic World.*

> *The Semantic World is a persistent and continuously evolving computational domain whose lawful organization is formed by persistent Identities, immutable Events, and Identity-Centric Persistent Relations. It is the computational environment upon which intelligent behaviors operate and from which meaning continuously emerges.*

> *Storage records and preserves data but has no intrinsic mechanism for maintaining semantic continuity. Any semantic interpretation must therefore be imposed externally.*

> *Intrinsic Memory is a computational substrate that preserves semantic continuity by maintaining Identity continuity, Event immutability, and Identity-Centric Persistent Relations. By preserving these persistent semantic structures and their continuity through time, Intrinsic Memory enables the continuous evolution of the Semantic World upon which meaning and intelligent behaviors emerge.*

## Architecture of Intelligence

Within this framework, intelligence is not regarded as an inherent capability of a computational system.

Instead, intelligent behaviors emerge through computation performed upon a persistent and continuously evolving Semantic World.

The Semantic World itself can emerge only where semantic continuity is preserved through Intrinsic Memory.

> *Intrinsic Memory → Semantic World → Intelligent Behaviors*

Every intelligent behavior described by this theory derives from this architectural dependency.

> *Intelligence is not stored. Intelligence emerges through computation performed upon a persistent and continuously evolving Semantic World.*

## Intelligent Behaviors

Within the proposed architecture, Intelligent Behaviors represent distinct computational processes performed over the Semantic World.

> *Learning is the lawful modification of the topology of the Semantic World. Learning reorganizes persistent Identities, immutable Events, Identity-Centric Persistent Relations, and Semantic Assertions while preserving the semantic continuity upon which meaning continuously emerges.*

> *Reasoning is structural computation performed over the persistent semantic structures of a Semantic World. It derives new semantic conclusions from existing Identities, Events, Identity-Centric Persistent Relations, and Semantic Assertions rather than creating meaning independently.*

> *Prediction is the generation of candidate future Events that remain consistent with the existing Semantic World. Prediction is therefore semantic generation rather than statistical extrapolation.*

> *Planning constructs future sequences of Events that satisfy desired objectives while respecting the semantic constraints of the existing Semantic World.*

> *Recall is the deterministic reconstruction of previously established semantic structures. Recall never mutates the Semantic World. Reasoning and Recall are therefore fundamentally distinct computational processes.*

## Why Existing Storage Is Not Enough

Conventional databases preserve data. Knowledge graphs preserve graph structures. Vector databases preserve numerical embeddings.

Each of these technologies addresses an important aspect of information management.

However, none of them are designed to preserve semantic continuity as a first-class computational property.

Their objective is information persistence rather than preserving the persistent semantic structures required for the Semantic World to continuously evolve.

Intrinsic Memory addresses a fundamentally different computational responsibility. Its purpose is not merely to store information, but to preserve the semantic continuity of persistent Identities, immutable Events, and Identity-Centric Persistent Relations required for the continuous evolution of the Semantic World.

> ***By preserving these persistent semantic structures and their continuity through time, Intrinsic Memory preserves the computational conditions under which meaning continuously emerges.***

## Intrinsic Memory Engines

The proposed architecture naturally introduces a new class of computational systems.

An Intrinsic Memory Engine is responsible for constructing, preserving, and maintaining a persistent and continuously evolving Semantic World.

Unlike databases, Intrinsic Memory Engines preserve the persistent semantic structures and semantic continuity required for the Semantic World to continuously evolve rather than merely storing data.

Unlike reasoning engines, they perform no inference.

> ***Their sole responsibility is preserving the computational substrate upon which the Semantic World continuously evolves and Intelligent Behaviors operate.***

## The Andisheh Engine

The Andisheh Engine is the reference implementation of an Intrinsic Memory Engine. It demonstrates how persistent Semantic Worlds can be constructed, preserved, and continuously evolved while maintaining semantic continuity as a first-class computational property.

Its computational architecture, mathematical foundations, and implementation are developed in subsequent papers throughout the Cosinia Research Series.

## Cosinia

Cosinia is the infrastructure platform built around the Andisheh Engine. It provides the services required to deploy, manage, and scale persistent Semantic Worlds for researchers, developers, enterprises, and intelligent systems.

The platform architecture and distributed infrastructure are presented separately within the Cosinia Research Series.

## Conclusion

The Architecture of Intelligence proposes a fundamental shift in how intelligent systems are understood. Rather than treating intelligence as an independent computational capability, it views intelligent behaviors as computations performed upon a persistent and continuously evolving Semantic World.

Such a Semantic World cannot arise from conventional storage systems alone. It requires a computational substrate capable of preserving persistent Identities, immutable Events, Identity-Centric Persistent Relations, and the semantic continuity through which the Semantic World continuously evolves. This responsibility belongs to Intrinsic Memory.

Within this architecture, meaning is not generated by isolated computation. It continuously emerges from the evolving semantic organization of the Semantic World, while intelligent behaviors operate upon that world rather than constructing it.

> ***Intrinsic Memory preserves semantic continuity. Semantic continuity enables the continuous evolution of the Semantic World. Meaning continuously emerges from that evolving Semantic World. Intelligent behaviors operate upon it.***

# References

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## Citation

Ketabchi, R. Architecture of Intelligence. Cosinia Research Paper No.1 Version 1.0

Next →