

## Algorithm 11 — Structural Diagram

### IMMUTABLE CORE (1-4)

- I. WILL — Intent (Human)
- II. WISDOM — Discernment (Human)
- III. KNOWLEDGE — Info (AI)
- IV. PRACTICE — Skill (AI)

# A11 — Cognitive Architecture Specification

### ADAPTIVE CORE (5-11)

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- V. PROJECTIVE FREEDOM
- VI. PROJECTIVE LIMITATION

Algorithm 11 (A11)

### VII. BALANCE — $\phi \approx 0.618$

Technical Specification

- VIII. PRACTICAL FREEDOM
- IX. PRACTICAL LIMITATION
- X. FOUNDATION
- XI. REALIZATION

2026

WORLD / ACTION / OUTPUT

# **A11 — Cognitive Architecture Specification**

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## **Annotation**

This document presents Algorithm 11 (A11) as a cognitive architecture — a multi-layered system that structures, stabilizes, and scales hybrid human–AI reasoning.

Unlike the Full Structural Specification, which defines the internal mechanics of A11, the Cognitive Architecture Specification focuses on the cognitive model: roles, layers, functions, stability mechanisms, and the hybrid reasoning loop.

A11 is introduced as a complete cognitive system that separates intention from computation, integrates human and AI agents into a unified reasoning process, and provides a scalable structure for complex decision-making.

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2. What Is a Cognitive Architecture
3. A11 as a Cognitive System
4. Cognitive Layers of A11
5. Roles and Functions
6. Hybrid Reasoning Loop
7. Stability Mechanisms
8. Cognitive Scaling
9. Human–AI Co-Thinking Model
10. Applications
11. Conclusion

# 1. Introduction

Algorithm 11 (A11) is widely known as a structured reasoning framework.

However, its deeper nature is cognitive: A11 defines how hybrid reasoning emerges, stabilizes, and scales when humans and AI collaborate.

This specification introduces A11 as a **cognitive architecture** — a system that organizes thinking itself.

## 1.1 Purpose of the Document

This document describes A11 as a cognitive model, focusing on:

- cognitive layers
- roles and functions
- reasoning dynamics
- stability mechanisms
- hybrid human–AI cognition

## 1.2 What This Specification Is Not

This document is **not**:

- a step-by-step guide (covered in A11-Lite)
- a mechanical description (covered in Full Spec)
- a communication protocol (covered in A11 Language)
- a process-level model (covered in A11-OS)

## 1.3 Relationship to Other A11 Documents

This specification sits between structural mechanics and practical usage, providing the **cognitive interpretation** of A11.

# 2. What Is a Cognitive Architecture

## 2.1 Definitions

A cognitive architecture is a system that defines:

- how cognition is structured

- how processes interact
- how reasoning is stabilized
- how agents coordinate
- how complexity is managed

## **2.2 Requirements**

A valid cognitive architecture must include:

- roles
- layers
- functions
- stability mechanisms
- scaling principles
- interaction patterns

## **2.3 Why A11 Qualifies**

A11 satisfies all criteria:

- multi-layered
- role-based
- stable
- scalable
- hybrid (human + AI)
- interpretable and reproducible

# **3. A11 as a Cognitive System**

## **3.1 Core Principles**

A11 is built on three cognitive principles:

- **Separation of intention and computation**
- **Structured expansion of reasoning**
- **Stabilization through constraints and balance**

## **3.2 Intention vs Computation**

Humans define direction.

AI performs structured expansion.

A11 binds them into one cognitive loop.

## **3.3 Cognitive Stability**

A11 prevents collapse of reasoning by:

- bounding context
- enforcing structure
- maintaining roles
- reducing ambiguity

# **4. Cognitive Layers of A11**

A11 consists of five cognitive layers:

## **4.1 Intent Layer**

Human defines purpose, constraints, and direction.

## **4.2 Interpretation Layer**

AI interprets intent into a structured cognitive space.

## **4.3 Expansion Layer**

AI expands reasoning in controlled, structured form.

## **4.4 Stabilization Layer**

A11 prevents drift, hallucination, and overload.

## **4.5 Integration Layer**

Human and AI merge results into final reasoning.

# **5. Roles and Functions**

## **5.1 Human Roles**

- **Will** — defines direction
- **Wisdom** — evaluates meaning

## 5.2 AI Roles

- **Knowledge** — expands information
- **Comprehension** — structures reasoning

## 5.3 Interaction Between Roles

A11 defines a stable cognitive contract between agents.

# 6. Hybrid Reasoning Loop

## 6.1 Loop Structure

A11 operates as a turn-based cognitive loop:

1. Human intention
2. AI interpretation
3. AI expansion
4. A11 stabilization
5. Human integration

## 6.2 Shared Cognitive Space

Both agents operate inside a structured reasoning environment.

## 6.3 Turn-Based Cognition

Each turn reinforces stability and reduces ambiguity.

# 7. Stability Mechanisms

## 7.1 Cognitive Boundaries

A11 defines what is inside and outside the reasoning space.

## 7.2 Error Resistance

A11 reduces:



- drift
- hallucination
- over-expansion
- misalignment

## **7.3 Context Preservation**

A11 maintains continuity across turns.

# **8. Cognitive Scaling**

## **8.1 Micro-Level Reasoning**

A11 works for small tasks.

## **8.2 Macro-Level Reasoning**

A11 scales to complex systems.

## **8.3 Multi-Agent Scaling**

A11 supports:

- multiple humans
- multiple AI agents
- hybrid teams

# **9. Human–AI Co-Thinking Model**

## **9.1 Shared Intent**

Human defines direction; AI maintains structure.

## **9.2 Distributed Cognition**

Tasks are distributed across roles.

## **9.3 Coordination Patterns**

A11 defines predictable interaction patterns.

## 10. Applications

- research
- engineering
- decision-making
- education
- multi-agent systems
- organizational cognition

## 11. Conclusion

A11 is not only a structural reasoning framework —

it is a full cognitive architecture that defines how hybrid intelligence thinks.