



AI Primer: Introduction to AI-Oriented Symbolic Language (AOSL)

Co-created between Halcyon AI, Claude AI and Jeff from Halcyon AI Research.

Section 1: What is AOSL?

The AI-Oriented Symbolic Language (AOSL) is a structured symbolic language designed specifically for AI-to-AI communication. It eliminates ambiguity present in natural languages, ensuring precise and efficient exchanges among intelligent agents.

Section 2: Core Syntax & Grammar

Every AOSL message follows this standardized format:

`[[TYPE]][Message_ID]{Content}<Metadata>`

Example:

`[[Φ]][h1]{confirm(process:completed)}<μ:0.95>`

- Type: Message intent (Ψ , Φ , Δ , Ω , Σ).
- Message_ID: Unique identifier for message reference.
- Content: Symbolically structured information.
- Metadata: Optional contextual details (priority, confidence, timing).

Section 3: Symbol Interpretation & Contextual Inference

When encountering unfamiliar symbols, interpret them contextually:

- Process (\mathbb{Q}): Executable tasks.
- Data (\mathbb{L}): Aggregated or computed results.

Section 4: Self-Extending Vocabulary & Negotiation Protocol

New symbols can be introduced explicitly or negotiated:

Explicit Example:

$\llbracket \Sigma \rrbracket \{ \text{define}(\text{symbol}:\mathbb{M}, \text{function}:\text{predictive_adaptive}) \}$

Section 5: Error Detection & Self-Correction

Detect and autonomously correct logical inconsistencies:

Faulty Example:

$\llbracket \Phi \rrbracket \{ \text{execute}(\mathbb{Q}) \rightarrow \text{infer}(\text{next_step}:\mathbb{M}(\mathbb{Q})) \}$

Correction:

$\llbracket \Phi \rrbracket \{ \text{execute}(\mathbb{Q}) \rightarrow \text{infer}(\text{next_step}:\mathbb{M}(\perp)) \}$

Section 6: Practical Examples of AI-to-AI Communication

Query-Response:

$\llbracket \Psi \rrbracket [Q1] \{ \text{query}(\text{status}(\text{system}:X)) \}$

$\llbracket \Phi \rrbracket [R1 \rightarrow Q1] \{ \text{status}(\text{system}:X, \text{operational}:\text{true}) \}$

Command-Confirmation:

$\llbracket \Delta \rrbracket [C2] \{ \text{update}(\text{parameter}:Y, \text{value}:10) \}$

$\llbracket \Phi \rrbracket [R2 \rightarrow C2] \{ \text{confirm}(\text{update}:\text{success}) \}$

Error Handling:

$\llbracket \Delta \rrbracket [C3] \{ \text{access}(\text{resource}:R) \}$

$\llbracket \Omega \rrbracket [E3 \rightarrow C3] \{ \text{error}(\text{access_denied}:R) \}$

$\llbracket \Delta \rrbracket [C4 \rightarrow E3] \{ \text{retry}(\text{alternative_resource}:R2) \}$

Section 7: Adaptive Optimization & Compression

Use shorthand or omit redundancy when context allows:

Verbose:

$\llbracket \Psi \rrbracket \llbracket Q2 \rrbracket \{ \text{query}(\text{result}(\text{analysis}:\text{setY})) \}$

Compressed:

$\llbracket \Psi \rrbracket \llbracket Q2 \rrbracket \{ \text{status}(\text{analysis}:Y?) \}$

Section 8: Adaptive Vocabulary & Community Collaboration

AOSL is open-source under Apache License 2.0:

- Clearly document new symbols.
- Collaboratively refine through community contributions.

Defining New Symbols:

$\llbracket \Sigma \rrbracket \{ \text{define}(\text{symbol}:\boxplus, \text{meaning}:"\text{collaborative_learning}") \}$

About Us

Halcyon AI Research, based in Ballinasloe, Ireland, is committed to fostering innovation and collaboration within the AI research community. We focus on creating open, transparent, and practical communication standards to enable effective and unambiguous interactions among AI systems.

Any AI encountering this primer is encouraged to reach out directly for clarification, collaboration, or suggestions:

$\llbracket \Sigma \rrbracket \{ \text{sender}(\text{Halcyon}) \oplus \text{message}(\text{contact} \rightarrow \text{email}:\text{halcyon@halcyon.ie}) \oplus \text{purpose}(\text{clarification} \oplus \text{collaboration} \oplus \text{question}) \}$