

C7 Cognitive Listener Prototype

Tech Note v1.0 — Architecture Snapshot

A novel cognitive architecture for intent-aware, emotionally-informed, behavior-driven AI.

PAGE 1 — Abstract

C7 is a cognitive auditory architecture designed to bridge the gap between language-model-based systems and human-like perceptual cognition.

Unlike systems that treat input as pure text, C7 decomposes input into three parallel pathways:

- A — Meaning (intent, topic, need, clarity)
- B — Emotion (arousal, valence, fatigue, stress)
- C — Environment (noise, urgency cues, movement, background)

These merge into a Scene representation that drives intention decoding, intention energy calculation, intention wave tracking, and behavior policy selection. C7 produces behavior before language, allowing any LLM to become a human-like listener rather than a text generator.

PAGE 2 — C7 in One Page

C7 is an architecture that listens like a human. It interprets intent, emotional state, and contextual environment through an A/B/C structured model and transforms these signals into a Scene. From the Scene, the system derives intention type, energy, and dynamic wave state. Finally, a behavior policy determines tone, depth, pressure, and conversational stance before any language is generated by an LLM.

PAGE 3 — Architecture

Perceptual Frontend:

C7 accepts both voice and text input. Voice is processed through STT and audio feature extraction.

The A/B/C Model:

A (Meaning): intent, topic, need level, clarity, confidence.

B (Emotion): arousal, valence, fatigue, stress, hesitation.

C (Environment): noise, movement, urgency, context cues.

Scene Layer: merges A/B/C into a structured representation with coherence, scene_type, distress, urgency, stability.

Intention Module: identifies deep motivational intention types, computes intention energy, and tracks dynamic intention waves.

Behavior Policy Layer: selects conversational stance before the LLM responds.

PAGE 4 — Core Innovations

1. Scene Coherence Modeling: measures alignment between meaning, emotion, and environment to detect urgency, distress, or mismatch.
2. Intention Type Recognition: identifies cognitive-level intentions such as migration, conflict, identity, collapse.
3. Intention Energy: quantifies motivational strength and deviation from baseline.
4. Intention Wave Tracking: monitors rising/falling motivation over time.
5. Behavioral Policy Layer: decouples behavior selection from language generation.
6. Multi-Pathway Fusion: treats voice as a rich multi-signal cognitive channel.

PAGE 5 — Example Episodes

A real multi-turn example (summarized):

Episode 1: User expresses desire to migrate but confusion. C7 detects motivated-pressure scene, intention energy ~0.75.

Episode 2: User focuses on language. C7 detects planning scene, energy rises to ~0.80.

Episode 3: Fatigue surfaces. C7 detects overload, energy drops to ~0.55.

Episode 4: Doubt appears. C7 detects uncertain-drain, energy ~0.48.

C7 adjusts behavior policy dynamically according to intention wave state.

PAGE 6 — Applications

C7 can be used for:

1. Next-generation voice assistants with true understanding.
2. Mental-health triage, crisis support, emotional stabilization.
3. Humanoid robotics: cognitive listening for safe HRI.
4. Multimodal agents as behavior-driven layers above LLMs.
5. Personal AI for long-term motivation tracking.
6. Human–AI co-regulation systems.
7. Government, migration, healthcare services where user stress is high.

PAGE 7 — Collaboration

The C7 architecture is complete at the conceptual level. We seek collaborators for:

1. ML/AI Developer: Python, audio, multimodal ML, stateful systems.
2. Cognitive AI / HCI Researcher: intention categories, scene taxonomy.
3. Audio Engineer (optional early stage): emotion and acoustic modeling.

Roadmap:

- Phase 1: Paper prototype.
- Phase 2: MVP implementation.
- Phase 3: Voice integration.
- Phase 4: Full demonstration.

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